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DEVELOPMENT THROUGH AGRICULTURAL EXPORTS: AN
ANALYSIS OF THE APPLICATION OF THIS STRATEGY
IN UGANDA

BY



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A THESIS

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The undersigned certify that they have read, and recommend
to the Faculty of Graduate Studies for acceptance, a thesis entitled:
Development through Agricultural Exports: An Analysis of the Application
of this Strategy in Uganda, submitted by Diamond Nasser in partial fulfilment
of the requirements for the degree of Master of Business Administration.

ABSTRACT

Development through the expansion of agricultural exports is one of the main strategies that can be applied in the economic development of an underdeveloped country like Uganda. However in the last decade or so, doubts have been raised by some economists whether this strategy is really the right means of achieving economic prosperity. This study will therefore examine the objections raised by these economists and will try to determine whether the above strategy is still appropriate for Uganda in the country's attempt to bring about rapid economic development.

The results of this study show that the arguments presented by the school of thought which opposes the reliance on agricultural exports for economic development, are of only limited validity as far as Uganda is concerned. The study comes to the conclusion that agricultural export development is still a superior strategy than the alternative strategy of development through industrialization.

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CHAPTER I

INTRODUCTION

The study of economic development has dominated economic thought since Adam Smith wrote his classic 'An Inquiry into the Nature and Causes of the Wealth of Nations'. Ever since, economists have continued to inquire why countries develop at varying rates.¹ Especially in the last two or three decades, this study has come under increasing attention as a result of the realization of the existence of widespread poverty in the underdeveloped countries. The widespread clamour for development of these countries has resulted in the formulation of many theories on ways to bring about rapid economic development. Among these, there are two main theories which have received considerable attention in economic literature. These are development through export promotion and development through industrialization. However like any theory of economics, or for that matter in any other subject, the proponents of each theory have challenged the validity of the other. The controversy resulting has filled thousands of pages in economic journals. This paper is another drop in the ocean of this controversy of selecting the best strategy of raising the standard of living of people in one underdeveloped country.

¹ G.M. Meier and R. E. Baldwin, Economic Development: Theory, History, Policy (New York: John Wiley and Sons, Inc., 1957), p. 10.

The objective of this study is to examine the appropriateness of relying on agricultural export promotion to bring about rapid economic development in Uganda.

To attain the objective of this study, the following issues will be examined:

1. The controversy surrounding international trade in primary products as a means of economic development.
2. The relevance of the above controversy to the situation which exists in Uganda.
3. The evaluation of the two strategies of economic development for Uganda.
4. The future scope of following the chosen strategy to achieve rapid growth in Uganda.

Although the controversy deals with export promotion in general, this study will be looking only at agricultural export promotion. The export of minerals is not being considered because of the very limited mineral potential of Uganda.

The export of manufactured goods as a strategy of economic development will also not be considered in this study. This is because the prospects for the export of these commodities to non-African countries are, in general, poor. This is due to tariff barriers, high transportation costs, and the inability of Uganda to compete with low cost producers from the Far East countries. The export prospects to the other African countries are also very limited. This is because these countries have similar productive potential and they have similar objectives regarding

industrial development.

Although industrialization includes the production of both consumer goods and capital goods, this study will deal only with the former. This is because most underdeveloped countries like Uganda, lack the natural resources, capital and skilled labor to go directly into the heavy industries. Moreover, there is no effective demand for the products of these industries. The only way that these countries can start to industrialize is through import substitution. The country can start to produce some of the manufactured goods which they had imported previously. The production of these manufactured goods would require relatively less capital, skilled labor and natural resources as compared to the heavy industries. Moreover there is an effective demand for these products within the country.

The advocacy of one strategy over the other, in this study, does not imply that no investment should take place in the latter. All investment projects, no matter in what sector, should go through the investment allocation criteria laid down in this study. If a particular project fulfills the criteria, then investment should be made in it. The conclusion regarding the "superiority" of one strategy only means that if the investment criteria were followed then most projects would be from that particular strategy which is considered superior.

Methodology

This study employs three main methods to develop a framework on which to judge the relevance of agricultural export development strategy for Uganda. Besides

the deductive method which runs through the entire study, regression analysis and an investment decision model are used. The regression analysis is used to determine the influence of agricultural exports on a selected set of variables in the domestic economy. The investment decision model is developed and used to evaluate the two strategies of economic development.

Limitation of the Study

The time that may be allotted to a development of a thesis, and the inadequate nature of data that are available, does not allow this study to make full use of the investment decision model. As a result a restricted use of the model is being made. However this restriction should not negate the broad conclusion reached regarding the superiority of one strategy of development over another.

The recommendation of this study, in favor of any particular strategy, is valid as long as the parameters used in the investment decision model remain constant. Any changes in these parameters would necessitate the re-working of the model. The consequent results may or may not support the recommendation of this study.

Organization of the Thesis

There are eight chapters to the main body of this thesis. Chapter II examines the controversy of international trade and economic development. Chapter III then looks into the benefits that Uganda has derived from her reliance on agricultural export trade. The following two chapters, Chapter IV and V, try to

determine the relevance for Uganda of the two main arguments presented by some economists against relying on primary products for economic development. In Chapter VI an investment decision model is introduced and it is applied to evaluate the two main strategies that are open to Uganda. Chapter VII deals with the future scope of agricultural exports. The last Chapter, i.e. Chapter VIII will give a summary of this study.

CHAPTER II

INTERNATIONAL TRADE AND ECONOMIC DEVELOPMENT

The concept of interdependence and specialization and through it the maximization of output and the optimization of economic well-being had been first advocated by Adam Smith¹ in his famous example of the pin-making factory. One can extend this example of interdependence and specialization from a single factory into an industry, from an industry into the economy of a nation, and from a nation into the international arena. The fundamental principle of economics will theoretically still hold true. World output of goods and services would be maximized and the economic well-being of the people optimized if each nation specialized in the production of those things in which it can do relatively better than others.²

In the beginning, classical economists like Adam Smith³ believed that international trade occurred because each country had an absolute advantage in the production of some commodity. However Ricardo⁴ and later on, John Stuart

¹ Adam Smith, An Inquiry into the Nature and Causes of the Wealth of Nations (New York: Modern Library, 1937), p. 4.

² Ingo Walter, International Economics (New York: The Ronald Press Company, 1968), p. 45.

³ Smith, loc. cit.

⁴ D. Ricardo, Principles of Political Economy and Taxation (London: J.M. Dent and Sons, 1911), p. 77-93.

Mill⁵ developed a general theory of international trade which was based on the broader concept of comparative advantage rather than the restrictive nature of absolute advantage. Ricardo⁶ in his general theory said that under conditions of free trade, each country would specialize in the production of those commodities in which it had comparative advantage (i.e. in relation to other countries). These commodities would then be exported in exchange for commodities in which the other countries have comparative advantage. As a result there would be optimum allocation of resources and all the countries would gain from free trade and international specialization.

The underdeveloped countries, in line with this theory of international trade, have specialized in the production of raw materials because they had plenty of land, unexploited natural resources and plenty of cheap labor. The production of these raw materials, mainly agricultural products, moreover needed very little capital which was in short supply in these countries. In the absence of any other major economic activity beside subsistence agriculture, these countries relied heavily on the production of these raw materials to increase their economic welfare. The standard of living of the people of these countries was tied mostly to the level of production in the export sector.

Besides the primary benefits of specialization and through it optimization of output, the exporting country will also have secondary and tertiary benefits.

⁵ J.S. Mill, Principles of Political Economy (New York: D. Appleton and Company, 1891), p. 377-390.

⁶ Ricardo, loc. cit.

M.H. Watkins⁷ looking at the development of the New World, said that the expansion of the export industry makes it profitable for the country to initiate and expand domestic production of the inputs used by the industry. The country could also go into the processing of the export products and the production of consumer goods for persons employed in the export industry.

Haberler⁸ also calls attention to the indirect benefits from trade. He says that international trade would transmit experience and ideas, change attitudes, encourage competition, and open up channels for capital inflows, as well as provide the foreign exchange to import capital goods for development.

The reliance on the export of primary products for achieving economic prosperity has however come under very close examination in the last two decades. Doubts have been raised by some economists whether export trade in agricultural commodities is really the right means of raising the standard of living of the people, in the underdeveloped world. Among the economists raising these doubts are two well known figures, R. Prebisch and H.W. Singer.

Prof. Raul Prebisch⁹ has claimed that the peripheral countries have

⁷ M.H. Watkins, "A Staple Theory of Economic Growth," Canadian Journal of Economics and Political Science, Vol. XXIX (May, 1963), p. 41-65.

⁸ G. Haberler, "Terms of Trade and Economic Development," Economic Development for Latin America, ed. H.S. Ellis (New York: St. Martin's Press, 1961), p. 275-297.

⁹ Raul Prebisch, "The Economic Development of Latin America and its Principal Problems," Economic Bulletin for Latin America (New York: United Nations, Department of Economic Affairs, 1950).

experienced long-run deterioration in their terms of trade with the central nations. This is because during the upswing of a trade cycle, the prices of primary products have a tendency to rise more rapidly than industrial goods prices, but the former prices would fall more in the down swings so that in the course of the trade cycles the gap between prices of the two would progressively widen. The prices of the industrial products do not fall as much as primary products because the monopolistic manufacturers, partly due to the pressure of trade unions, would reduce output rather than price. On the otherhand, prices of primary commodities, would drop because neither the producers nor the workers in the less developed countries have sufficient monopoly power to influence the world prices of the items they produce.¹⁰

Another reason given by Prebisch and also by Singer¹¹ for worsening of the terms of trade is that when there is an increase of productivity in developed countries, the benefit is passed on to the workers in the form of higher wages and to

¹⁰ An interesting exception to this has been the recent agreement among the Middle East Oil producers to present a united front when bargaining with western oil companies. However this monopoly power exists only due to extraordinary circumstances like shortage of tankers and the closing of the Suez Canal. The producers of the other primary products do not have such monopoly power. This is partly because supply for some of these products exceed the world demand. The diversity and the existence of conflicting interests of the producers also make it impossible to come to a similar agreement.

¹¹ H. W. Singer, "The Distribution of Gains between Investing and Borrowing Countries." American Economic Review, Papers and Proceedings, Vol II, No. 2 (May, 1950), p. 473-494.

the management in the form of profits rather than to the consumer in the less developed countries. On the otherhand, when technical progress occurs in the peripheral countries they claim that the developed countries obtain a major share of the technical progress in the form of lower prices. This is because in underdeveloped countries the wage level is determined by the low marginal productivity of domestic industries. Technical progress will simply lower prices of the export good without affecting wages.

Another argument which has been presented to prove the worsening of the terms of trade pertains to the working of Engel's law. Engel's law states that as income increases, the proportion of income spent on food decreases. This law is then extended to include raw materials and it is claimed that the income elasticity of demand for raw materials is low. On the otherhand, the income elasticity for manufactured goods is high. Therefore the centre countries would be in a better bargaining position. Among the reasons given for low income elasticity of demand for raw materials has been the development of synthetic substitutes and the development of technology which minimize raw material usage.

Various attempts have been made to prove empirically the worsening of the terms of trade for the underdeveloped countries. One such attempt has been made by P.L. Yates¹². He looks at the relative price trend from 1913 to 1955 of

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K. Kojima, "Trend and Fluctuations in the Terms of Trade of Primary Exports," Hitotsubashi Journal of Economics, Vol. V., No. 2 (January, 1965), p. 12-26, citing P.L. Yates, Forty Years of Foreign Trade (London: Allen and Unwin, 1959).

34 primary exports including 18 kinds of food items, 9 kinds of raw materials and 7 kinds of minerals and metals. He then classifies the price trend into three sections.

A Type: Downward long run price trend

He says that this is the most typical characteristic of primary exports.

Commodities in this section are:

Food: Wheat, maize, rice, eggs, salted cod, cheese, cocoa, coffee, linseed oil, edible oil, and butter.

Agricultural raw materials: Cotton, wool, jute, sugar, rubber and newsprint.

Minerals and metals: Copper and aluminum.

B Type: Constant long run price trend

These commodities are:

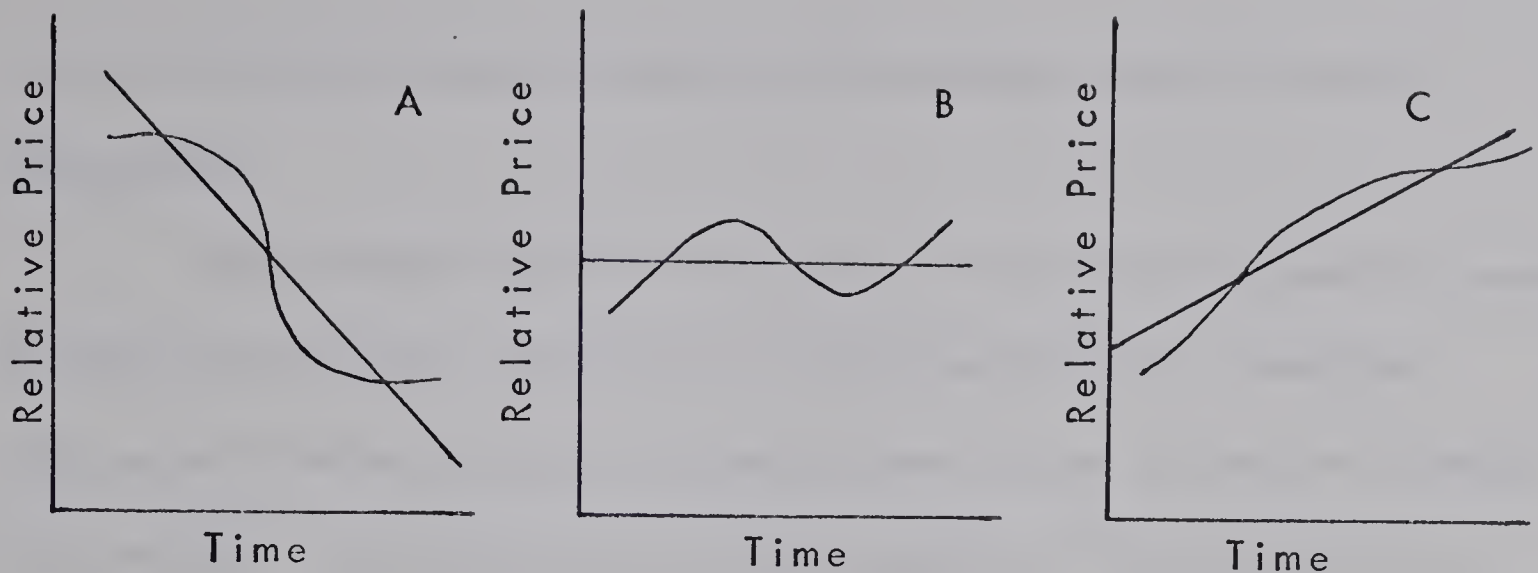
Food: Beef, bacon, mutton, tea, dried fruit, citrus and bananas.

Agricultural raw materials: Tobacco and chemical woodpulp.

Minerals and Metals: Tin, lead, zinc, and crude oil.

C Type: Upward long run price trend

Out of 34 commodities, only two commodities i.e. softwood and coal came into this category.



Thus it can be seen that Type A commodities are most prevailing. Out of 34 products, 19 (54%) fell into this category. The terms of trade of the countries producing these commodities have therefore worsened. Most of these countries form part of the underdeveloped world.

The worsening of the terms of trade for primary products has not been the sole argument for reducing the reliance on the export of primary products. Another argument which has been put forward has been the fluctuations in export earnings from these products. It is claimed that these fluctuations will have harmful repercussions on the economy.

A number of explanations have been put forward by economists to explain the causes of fluctuations of export earnings in underdeveloped countries. One of the major ones being the inelastic nature of supply and demand for raw materials in the short run.

The short run supply of primary commodities is inelastic because there exists a gestation period between planting and harvesting. Supply therefore cannot be increased in the short run. Other factors influencing the supply are weather and disease. Both of them are, to a certain extent, beyond the control of man. More-

over raw materials are usually perishable and therefore they cannot be stored for a long period.

On the demand side there is short price run inelasticity because the demand for food crops are limited. Also most raw material costs form only a small part of the price of the final product and therefore, even if prices of these raw materials drop, the effect on the final demand would be negligible. The demand function is also affected by the tendency of developed countries to intensify import barriers during periods of low economic activity.

Another factor which leads to instability in export proceeds of an underdeveloped country is the high concentration on a small range of export commodities. If the exports were diversified, short run drop of earnings of one or two commodities would be compensated, in a probabilistic sense, by the increase of earnings from other commodities.

The heavy reliance on the market of a limited number of countries also would affect the degree of instability in export proceeds. There is heavy reliance on some countries because of the past colonial ties. It is reasonable to expect that the more a country's market is diversified, the less will be the instability of export earnings.

According to U.N. studies¹³, the mean year-to-year variation in the price

¹³ "Fund Policies and Procedures in Relation to the Compensatory Financing of Commodity Fluctuations," IMF Staff Papers Vol. VIII, No. 1 (November, 1960), p. 5 citing UNO, Instability in Export Market of Underdeveloped Countries, (New York: 1952).

of individual primary products have averaged some 13 per cent over the period 1900 to 1958.

The volume of exports of primary products has also been unstable. An IMF study shows that the volume of exports from an average primary producing country varies from year to year by as much, if not more, than the price.¹⁴ Although it is possible that the fluctuations in price might compensate the fluctuations in volume, in some instances the simultaneous fluctuations would aggravate the situation.

The arguments put forward against the reliance on the export sector for economic development has however come under criticism from some economists. Johnson criticizing the terms of trade argument said that:

"The prominence of the argument is an example of the power of a politically appealing economic myth to survive logical and empirical criticisms of a kind that would have dismissed purely scientific economic propositions especially when the proponent is a man of international eminence in the policy field."¹⁵

Another economist, R. Baldwin¹⁶, says that even if the statistical evidence put forth by these people is accepted, it does not mean that the less developed countries have suffered an absolute loss in real income through international trade. This is because total production in underdeveloped countries has increased with better

¹⁴ IMF Staff Papers, loc. cit., p. 6-7.

¹⁵ H. G. Johnson, "Comment," Agricultural Development and Economic Growth, ed. H.M. Southworth and B.F. Johnston (New York: Cornell University Press, 1967), p. 451.

¹⁶ R. E. Baldwin, Economic Development and Export Growth (Berkeley: University of California Press, 1966), p. 9.

techniques of production and greater utilization of resources. Moreover, he says that the quality of manufactured goods has increased. Thus he claims that there has been real income gains by these countries.

Haberler¹⁷, criticizing the statistical methods, says that the existing terms of trade indices are grossly deficient. This is because they do not take into account the introduction of hundreds of new commodities. Moreover no provision has been made to record the increase in the quality of goods. Therefore he maintains that it would not be possible to draw a meaningful conclusion in favor of the Prebisch Singer thesis.

Haberler also mentions that the underdeveloped countries are not the only producers of primary products since some of the developed countries also export primary products. However one should look at the proportion of exports of these countries which are in primary products. One should also look at the importance of these products in the domestic economy. The underdeveloped countries rely solely on primary products for their export. Moreover these exports form a large part of the gross domestic product of these countries.

The issue of export instability of countries specializing in primary products has also come under criticism. MacBean¹⁸ contends that in general the less

¹⁷ Haberler, loc. cit.

¹⁸ A. MacBean, Export Instability and Economic Development (Cambridge: Harvard University Press, 1966).

developed countries are little, if any more, subject to fluctuation of export earnings than the developed countries. Also he has questioned whether export instability has had much effect on economic development.

The views of MacBean are supported by a study done by T.D. Coppock who calculated instability indices for the total value of world trade in primary commodities and in manufactured goods for the period 1948 to 1958. The results showed that the manufactured goods have been more unstable with an index of 6.8 compared to an index of 3.8 for primary commodities.¹⁹ However oil exports, which account for a large proportion of world exports of primary products, have exerted a strongly stabilizing influence. Oil export proceeds came twenty-fourth out of twenty nine primary products ranked in terms of instability.²⁰

The short run price instability of demand has also been questioned. It is claimed that the demand curve faced by an individual country, if it is not a major producer of a particular commodity, is very elastic. The country will be able to sell all it can produce by reducing the price slightly below the one determined by the supply and demand relationships in the world market.

The defects of the statistical methods employed by various economists, the problems connected with the use of aggregate data in cross-country analysis, and

¹⁹ T.D. Coppock, International Economic Instability (New York: McGraw Hill, 1962), p. 47.

²⁰ Ibid., p. 45.

the lack of uniformity in the statistical data all makes it difficult to come to any meaningful conclusion regarding the harmful effects of relying on primary products for economic development. Therefore there is need to examine individual countries and make policy decisions regarding a country's reliance on export of primary products based on her particular situation and her past experience.

CHAPTER III

BENEFITS TO UGANDA

The most significant economic development in underdeveloped countries, especially in Uganda, since the beginning of this century, has been the enlargement of the money economy through the shift of resources into the production for the export market. In the beginning of this century, Uganda was in a stage of economic development which Rostow¹ defines as the "traditional society." This stage of development was stagnant both economically and socially. The economy was organized to fulfill only the basic needs of the people, like food and shelter. There was very little specialization and trade within the country or with other countries. However, with the opening up of the country by Britain and with the introduction of transport and marketing facilities, trade began between Uganda and the outside world. Labor and land production potentials, which were in excess of domestic food requirements, were brought into the production of export crops. This provided farmers with cash income to buy manufactured goods and to invest part of this income. The vicious circle of stagnation which existed in the traditional society was broken down. The specialization in agricultural products and its exchange for manufactured goods has been in line with the comparative cost theory advocated

¹ W.W. Rostow, The Stages of Economic Growth (Cambridge University Press, 1969), p. 4-6.

by classical economists like Ricardo² and the factor endowment approach advocated by Heckscher³ and Ohlin.⁴

This chapter will examine the characteristics of the Uganda economy and will then try to assess the benefits that the country has received through this specialization in agricultural exports. The chapter will not only deal with the direct benefit of agricultural exports as a source of income for the farmers and revenue for the government, but will also examine its contribution in providing funds for capital development.

3.1 Characteristics of the Uganda Economy

Although seventy years have passed since the country was first opened to the western world, Uganda is still a typical example of an underdeveloped country. In 1968, with an estimated population of 9.3 million, the country had a gross domestic product of £ 317.6 million, giving a per capita income of only £ 34.2⁵

The economy of the country is based on agriculture. Two thirds of her gross domestic product is derived from farming and agricultural processing. Over 90 per cent of her population derive their livelihood from agricultural activities.

² Ricardo, loc. cit.

³ E.F. Heckscher, "The Effect of Foreign Trade on the Distribution of Income," Ekonomisk Tidskrift, Vol. XXI (1919), p. 497-512.

⁴ B. Ohlin Interregional and International Trade (Cambridge: Harvard University Press, 1933).

⁵ The monetary unit used here, and throughout this study, is a Uganda pound. It is equivalent to 2.80 U.S. dollars.

Table 1 shows that exports from this sector accounts for 85 to 90 per cent of total domestic exports. In 1950 agricultural exports contributed to 47.5 per cent of her monetary gross domestic product. Although the percentage has declined since then, being 24.6 per cent in 1968, there has been an absolute increase in agricultural exports and the earnings from these exports still play a major role in her economy.⁶ (Table 2)

The chief export commodities are coffee and cotton. These two crops account for more than 80 per cent of Uganda's export earnings. The other main agricultural export crops are tea and tobacco, however they together account for less than 10 per cent of total domestic exports. The only non agricultural export commodity of any significance is copper which accounts for slightly less than 10 per cent of total exports.

The sale of agricultural products for export provide the farmers with more than 50 per cent of their cash income. This figure would have been even higher had there been no export duty on these products. Export taxes absorb about 25 per cent of net payments to African farmers for their export crops. The working of the marketing boards has in the past also been responsible, to a certain extent, for reducing the farmers' cash income.

Table 3 shows the amount of labor employed on farm holdings in 1965.

⁶ The contribution of agricultural exports to monetary gross domestic product cannot be strictly comparable over the period. This is because there has been some changes in definition and coverage in the last few years.

TABLE I

CONTRIBUTION OF AGRICULTURAL EXPORTS TO THE TOTAL EXPORTS
OF UGANDA

Year	Total Exports ^a £ m	Agricultural Exports ^a £ m	Agricultural Exports as Percentage of Total Exports
1950	28.7	25.8	90
1951	47.2	43.7	93
1952	47.2	43.2	92
1953	33.4	29.4	88
1954	40.6	36.6	90
1955	41.9	38.7	92
1956	40.4	37.0	92
1957	45.9	41.1	90
1958	45.4	40.8	90
1959	42.1	36.3	86
1960	41.6	35.1	84
1961	39.2	33.5	85
1962	37.6	32.0	85
1963	51.5	44.8	87
1964	64.4	54.9	85
1965	62.7	51.1	81
1966	65.9	55.8	84
1967	64.6	54.6	84
1968	65.5	55.3	84

^a Exports, here and throughout this study, are defined as Uganda produced commodities exported to countries outside East Africa.

Source: Kyesimira, Agricultural Export Development (Nairobi: East African Publishing House, 1969), p. 17., Uganda Statistical Abstracts.

TABLE 2

AGRICULTURAL EXPORTS AS PERCENTAGE OF MONETARY GROSS
DOMESTIC PRODUCT

Year	GDP (monetary) £ m	Agricultural Exports £ m	Agricultural Exports as percentage of GDP
1950	54.3	25.8	47.5
1951	83.8	43.7	52.1
1952	88.3	43.2	48.9
1953	76.3	29.4	38.5
1954	92.8	36.6	39.4
1955	102.0	38.7	37.9
1956	102.8	37.0	36.0
1957	109.4	41.1	37.6
1958	105.9	40.8	38.5
1959	108.0	36.3	33.6
1960	110.8	35.1	31.7
1961	137.0	33.5	24.5
1962	137.9	32.0	23.2
1963	158.6	44.8	28.2
1964	179.1	54.9	30.7
1965	196.2	51.1	26.0
1966	212.0	55.8	26.3
1967	212.4	54.6	25.7
1968	224.8	55.3	24.6

Source: D. P. Ghai, Taxation for Development, A Case Study of Uganda (Nairobi: East African Publishing House, 1966), p. 17.
 Y. Kyesimira, loc. cit., p. 17
Background to the Budget, 1970/71, p. 4.

The two main agricultural export crops, cotton and coffee, are responsible for providing jobs for more than 55 per cent of total farm labor.

TABLE 3
MAIN PURPOSE FOR WHICH LABOR WAS EMPLOYED IN
DIFFERENT FARM HOLDINGS
1965

Region	Weeding and Picking Cotton	Weeding and Picking Coffee	Total Cotton and Coffee	All others
Uganda	255,086	195,695	350,781	275,540
Buganda	48,262	150,704	198,966	50,463
Eastern	118,656	21,226	140,882	99,124
Western	7,253	20,068	27,321	47,775
Northern	80,915	3,697	84,612	78,178

Source: S.H. Jiwani, "Agricultural Statistics in Uganda" (unpublished Master's dissertation, Faculty of Agriculture, Makerere University, 1970), p. 89 citing Report on Uganda Census of Agriculture, Vol. 1, 1965, p. 61.

Thus we can see the dominant position of agricultural exports in Uganda's economy. Given this dominant position, agricultural exports have to provide the necessary funds for developing the country. The country will also have to focus a significant amount of its development effort on agricultural export development.

3.2 Agricultural Exports as a Source of Government Revenue

The Uganda tax system displays many of the features common to under-developed countries. Table 4 gives a summary of the Uganda government tax revenue for 1966/67 and 1967/68.

TABLE 4
UGANDA GOVERNMENT TAX REVENUE

Tax Source	1966/67	%	1967/68	%
Income Tax	7.92	20.38	10.10	24.24
Export Taxes	8.10	20.84	8.84	21.22
Import Duties	12.98	33.39	12.75	30.60
Excise	8.17	21.02	8.40	20.17
Others	<u>1.70</u>	<u>4.37</u>	<u>1.57</u>	<u>3.77</u>
Total	£ 38.87 M	100.00	41.66	100.00

Source: Uganda Statistical Abstracts

From the above table we can see the importance of foreign trade in Uganda's economy. Export taxes, mostly on cotton and coffee, contribute over 20 per cent of government revenue. Import duties play an even more significant role by contributing more than 30 per cent of the total government revenue.

This dependence on foreign trade to generate government revenue has a number of advantages. The main advantage is the low cost of collection. It is easy to collect taxes since the two major exports i.e. cotton and coffee are handled by the marketing boards. Import duties can be collected easily since most of the imports come by rail through Mombasa. The taxes on foreign trade also do not require a complex administrative machinery. Evasion of these taxes is also almost impossible.

Table 5 shows the amount of agricultural duty collected in the period 1950 to 1968. The amount collected has varied from a low of £2.71 million in 1961 to a high of £8.76 million in 1964.⁷ The percentage contribution of this tax to total government revenue has varied from 60.4 per cent in 1951 to 13.6 per cent in 1961. The low yield in 1961 and 1962 has been due to draught conditions existing in these two years. The amount collected in 1964 was higher than in 1951 but the percentage contribution has dropped because of the rapid expansion of other sources of revenue.

⁷ The rate of export taxes in Uganda depends solely on the price of exports. There is a price floor below which no duty is levied. For cotton (A.R. Quality) the average rate of taxation rises with price increases (beyond a price floor of 50 cents f.o.r. per pound) tending towards a constant marginal rate of 24 per cent. In April 1961, the marginal rate was decreased to 20 per cent.

For coffee, up to August 1956, the price floor for robusta was £36 per ton. Beyond this floor there was a constant marginal rate of taxation of 20 per cent. In August 1956, the floor was raised to £90 per ton f.o.b., and the marginal rate to $28 \frac{4}{7}$ per cent. The price floor was again raised to £120 per ton in 1957 with the marginal rate of $33 \frac{1}{3}$ per cent. In April 1963, the marginal rate was continued at $33 \frac{1}{3}$ per cent while the price floor was dropped to £90 per ton.

TABLE 5

GOVERNMENT REVENUE FROM AGRICULTURAL EXPORT TAXES

Year	Export Duty on Agricultural Products £ m	Total Tax Revenue £ m	Agricultural Export Duty as a Percentage of Tax Revenue
1950	4.17	8.34	50.0
1951	8.11	13.42	60.4
1952	8.27	14.26	58.0
1953	4.04	11.11	36.4
1954	6.63	15.33	43.2
1955	5.81	15.44	37.6
1956	6.17	16.61	37.1
1957	6.26	17.11	36.6
1958	5.68	17.32	32.8
1959	4.99	17.53	28.5
1960	3.30	16.48	20.0
1961	2.17	15.98	13.6
1962	2.54	18.03	14.1
1963	5.57	22.71	24.5
1964	8.76	28.54	30.7
1965	7.32	30.87	23.7
1966	6.54	34.34	19.0
1967	8.44	40.18	21.0
1968	7.76	44.48	17.4
Average:			31.8

From 1954 the financial year runs from July to June. Therefore tax revenue for 1954 and latter years are obtained by averaging two financial years.

Source: Ghai, *loc. cit.*, p. 24.
Uganda Statistical Abstracts.

Table 6 shows agricultural export taxes as a percentage of agricultural export proceeds. This percentage has varied from a high of 19.1 per cent in 1952 to a low of 6.5 per cent in 1961. The average percentage for the period has been 14.1 per cent. This percentage however does not show the real burden of the agricultural export taxes on the Uganda farmers. The actual burden is shown in Table 7. The cotton and coffee export taxes form an average of 27.17 per cent of the net cash receipts of the African farmers⁸ from these two crops. The percentage has varied from a high of 57.3 per cent in 1951 to a low of 9.5 per cent in 1961. If the tax burden is examined from the gross farm income (net cash receipts of farmers and export duties), the average rate of taxation for the period 1950-68 has been 21.36 per cent.

Before 1954/55 financial year, the amount collected from agricultural export taxes went to the current revenue account. Part of this revenue was then used for development purposes. However since then it has been decided to transfer any excess revenue over £ 4 million from export taxes directly into the capital development fund.

3.3 Price Assistance Funds

This section examines the part played by the marketing boards, through

⁸ Net cash receipts defined as export proceeds f.o.b. less government impact (export taxes and marketing board surplus/deficit) and minus processing and transportation costs.

TABLE 6

AGRICULTURAL EXPORT TAXES AS PERCENTAGE OF AGRICULTURAL
EXPORTS

Year	Agricultural Exports £ m	Agricultural Export Tax £ m	Export tax as Percentage of Agricultural Exports
1950	25.8	4.17	16.2
1951	43.7	8.11	18.6
1952	43.2	8.27	19.1
1953	29.4	4.04	13.7
1954	36.6	6.63	18.1
1955	38.7	5.81	15.0
1956	37.0	6.17	16.7
1957	41.1	6.26	15.2
1958	40.8	5.66	13.9
1959	36.3	4.99	13.7
1960	35.1	3.30	9.4
1961	33.5	2.17	6.5
1962	32.0	2.54	7.9
1963	44.8	5.57	12.4
1964	54.9	8.76	15.9
1965	51.1	7.32	14.3
1966	55.8	6.53	11.7
1967	54.6	8.44	15.0
1968	55.3	7.76	14.0
		Average:	14.1

Source: Kyesimira, loc. cit., p. 17.
 Ghai, loc. cit., p. 24.
Uganda Statistical Abstracts.

TABLE 7

TAX BURDEN ON COTTON AND COFFEE FARMERS

Year	Cotton and Coffee Receipts ^a £ m	Export Duty on Cotton and Coffee £ m	Export Duty as Percentage of Receipts
1950	9.37	4.14	44.2
1951	13.98	8.01	57.3
1952	16.26	8.22	50.5
1953	16.10	4.01	24.9
1954	21.22	6.57	31.0
1955	27.65	5.72	20.7
1956	21.92	7.14	32.6
1957	23.65	6.27	26.5
1958	24.60	5.68	23.1
1959	25.45	4.94	19.4
1960	24.02	3.25	13.5
1961	22.32	2.12	9.5
1962	17.91	2.50	13.9
1963	26.68	5.53	20.7
1964	29.18	8.72	30.0
1965	34.50	6.92	20.2
1966	36.21	4.67	12.9
1967	25.47	8.38	32.9
1968	23.75	7.71	32.5
		Average:	27.17

^a Net cash receipts to farmers from cotton and coffee. This term is defined as export proceeds f.o.b. less government impact (export taxes + marketing board surplus/deficit) and minus processing and transportation costs.

Source: Ghai, loc. cit., p. 24.

F. Ojow, "Export Instability in Uganda's Economy," University of East Africa Social Sciences Council Conference, 1968/69, p. 181.

Uganda Statistical Abstracts.

the price assistance funds, in generating funds for development purposes.

The Uganda government entered the field of agricultural marketing during the second World War. This was part of the wartime arrangements under which the Uganda government exported coffee and cotton to allied countries at a negotiated price. In order to facilitate the job of marketing, the government established each year a fixed price at which the crops would be purchased from the African growers. Initially the price paid to the farmers were in line with the expected export price. However, with the rapid rise in export prices, the prices paid to the growers lagged behind and so by 1948 about £10 million had been accumulated in a reserve fund.

In 1948 the marketing arrangements were reorganized. Marketing Boards – the Lint Marketing Board and the Coffee Industry Board – and their corresponding Price Assistance Funds were established for cotton and coffee respectively. Out of the accumulated £10 million, £3.5 million was allocated to the Cotton Fund and £0.5 to the Coffee Fund, while the remaining £6 million was earmarked for various development projects.⁹

The Price Assistance Funds were administered by the respective Marketing Boards for the stated purpose of price stabilization. They were built by the "profits" of the boards i.e. the excess of revenue from the sale of crops over the price paid to the producers minus marketing costs and export duties. If the Board experienced

⁹ D. Walker, "Marketing Boards," Problems in Economic Development, ed. E.A.G. Robinson (New York: St. Martin's Press, 1965), p. 574-598.

a net loss over any season, the reserve funds were drawn upon to pay a guaranteed price to the producers.¹⁰

The two Price Assistance Funds had been accumulating funds rapidly up to 1954. This was partly due to an accident of a substantial rise in export prices and partly due to deliberate intent of not paying a high price since the Board anticipated that the high export prices would not remain for long. There was also the fear that if the extra revenue was passed to the African farmers, it might result in heavy demand on local consumer goods which would not be readily available in the short run and thus would exert strong inflationary pressures.

As the funds began to accumulate, various amounts were withdrawn for development purposes. These withdrawals occurred as a result of a decision in 1952 to limit the Cotton Fund to a maximum of £20 million. Any sum above this amount could be transferred by the Legislature. In 1952, £5 million was initially transferred. At the end of 1952-1953 season the Cotton Price Assistance Fund stood at £29.5 million and so a further £9.5 million was transferred. By 1955 a total of £18.2 million had been transferred to the African Development Fund. In 1957 - 1958 season a sum of £5 million was "borrowed" from the Cotton Fund to finance government capital expenditure.¹¹

In addition to the above withdrawals, the Cotton Price Assistance Fund

¹⁰ J.E. Haring, Susan Christy, and J.F. Humphrey, "Marketing Boards and Price Funds in Uganda 1950 - 1960," Journal of Agricultural Economics, p.345-56.

¹¹ *Ibid.*, p. 351.

has been paying out a bonus of about £0.35 million every year to the African Local governments.

After the peak of the Price Assistance Funds, in the mid-1950's, there has been considerable run down of the two funds because of declining prices. In order to reduce this run down there has been substantial decreases in prices paid to the producers.

Tables 8 and 9 show the position of the two funds for the period 1948-1968. The amount shown in the Cotton Fund includes £5 million which was borrowed by the government in 1957-1958 season. This amount is really not available for price assistance purposes. If this amount is deducted, the Cotton Fund by 1968 had been completely exhausted.

The running down of the Price Assistance Funds might imply that the government is paying the farmers higher prices than would be possible in the absence of the Marketing Boards. However, as mentioned previously, there is an export tax on the agricultural products. The government revenue from this source has been in most years, substantially higher than the reduction in the Price Assistance Funds. Therefore the net government impact has been a lower income to the farmers.

3.4 Investment by the Uganda Government

This section will examine the use that has been made by the Uganda government of the funds that have been generated through the Price Assistance Funds and through the Export Taxes.

TABLE 8
THE STATE OF THE COTTON ASSISTANCE
FUND

Date	Balance at Date £ m	Government Withdrawal ^a (-) between Dates £ m	Surplus (+) or ^a deficit (-) from operation £ m	Net Change £ m
31/12/48	3.5			
31/12/49	5.6	-	2.1	2.1
31/12/50	8.6	-	3.0	3.0
31/12/51	21.4	-	12.8	12.8
31/12/52	22.4	-5.0	6.0	1.0
31/12/53	20.3	-9.5	7.4	-2.1
30/6/54	21.8	-3.7	5.2	1.5
30/6/55	18.8	-	-3.0	-3.0
31/10/56	19.4	-	0.6	0.6
31/10/57	20.4	-	1.0	1.0
31/10/58	18.1 ^b	-5.0	2.7	-2.3
31/10/59	16.3	-	-1.8	-1.8
30/6/60	16.4	-	0.1	0.1
30/6/61	17.7	-	1.3	1.3
30/6/62	17.3	-	-0.4	-0.4
30/6/63	15.8	-	-1.5	-1.5
30/6/64	12.8	-	-3.0	-3.0
30/6/65	13.0	-	0.2	0.2
30/6/66	12.1	-	-0.9	-0.9
30/6/67	9.8	-	-2.3	-2.3
30/6/68	5.9	-	-3.9	-3.9

^a Does not include annual bonus of about £ 350,000 paid to African Local Governments.

^b From 1958 the amount comprises of the balance in the custody of the Treasury as at June 30th, plus funds with the Lint Marketing Board as at October 31.

Source: Computed from Uganda Statistical Abstracts.

TABLE 9

THE STATE OF THE COFFEE ASSISTANCE FUND

Date	Balance at Date £ m	Surplus (+) or Deficit From Operation £ m
31/12/48	0.5	
31/12/49	1.1	0.6
31/12/50	4.5	3.4
31/12/51	9.1	4.6
31/12/52	12.7	3.6
31/12/53	14.8	2.1
30/6/54	15.2	0.4
31/6/55	11.9	-3.3
31/10/56	10.3	-1.6
31/10/57	10.7	0.4
31/10/58	12.0	1.3
31/10/59	11.6	-0.4
30/6/60	11.2	-0.4
30/6/61	6.6	-4.6
30/6/62	5.1	-1.5
30/6/63	4.0	-1.1
30/6/64	4.9	0.9
30/6/65	5.2	0.3
30/6/66	4.5	-0.7
30/6/67	4.5	0.0
30/6/68	4.5	0.0

Source: Computed from Uganda Statistical Abstracts.

In 1945 the total expenditure of Uganda government was £ 3.6 million. In 1950 it was £ 8.0 million. Between 1950 and 1953 the expenditure rose from £ 8 to £ 17.5 million.¹²

This increase in expenditure was achieved without any significant attempt to increase government revenue through changing of tax rates. Such a rapid growth rate in the government expenditure was made possible only because of the increase in revenue from agricultural export taxes and from the siphoning of funds from the Price Assistance Funds. The increase in revenue enabled the government to provide much needed social service and devote a substantial amount of government revenue to capital projects.

During the period 1955/56 - 1959/60 the educational spending program was greatly expanded and it absorbed more than 19 per cent of total central government expenditure. The magnitude of this expenditure led the World Bank mission to make the following comment:

"Only a few countries in the world, developed and underdeveloped, at present spend a greater proportion of per capita income or total public expenditures on education services than Uganda."¹³

During the forties and fifties the Uganda government was able to siphon off from the high export prices, funds to build up most of Uganda's modern economy outside of agriculture. The importance of the public sector in this capital formation

¹² International Bank of Reconstruction and Development, The Economic Development of Uganda (Baltimore: John Hopkins Press, 1962), p. 31.

¹³ Ibid., p. 34.

can be seen clearly from the comment of the World Bank Mission given below:

"Close to 60 per cent of capital formation in 1959 was undertaken by the public sector. The remainder represented private investment. A somewhat similar ratio has probably prevailed throughout most of the post war period." ¹⁴

Table 10 shows the sources of development funds for the period 1945 - 1960. It can be seen that the Price Assistance Funds has contributed more than three-quarters of development expenditure.

TABLE 10
SOURCES OF DEVELOPMENT FUNDS IN UGANDA 1945-60 (£ '000)

From	To: Reserve Fund of P.W.D.	The 4 1948 Funds	African Develop. Fund	Capital Develop. Fund	Local Invest. Fund	Total
Wartime Accumulation Cotton P.A.F.	703	---	---	---	---	703
(a) grants	---	6,000	18,200	---	---	24,200
(b) loans	---	---	---	5,000	---	5,000
Coffee P.A.F.						
General	---	625	---	---	---	625
Revenue Balance	---	---	---	178	7,899	8,077
TOTAL	703	6,625	18,200	5,178	7,899	38,580

Source: Kyesimira loc. cit., p. 10.

¹⁴ Ibid., p. 36

Besides the contribution of cotton and coffee towards development through withdrawals from the Price Assistance Funds, these two crops have provided during the period £19.3 million for development projects through export taxes. This contribution was as a result of the decision in the 1954/55 financial years to transfer any excess revenue over £4 million from export taxes into a capital development fund.¹⁵

The substantial investment by the government had limited effect on output in the short run. In the early years there was a great attempt to build the infrastructure through investment in power and communications sectors. There was also a good deal of public money spent in the building of cement and textile industries and assisting in the establishment of copper mining and refining. In the middle years the emphasis was on the development of education and medical services. However, only now when there is a shortage of revenue, that the government is emphasizing investment in methods to increase agricultural output and incomes fairly quickly. The past investment has however had beneficial effect on Uganda. The country now has a good infrastructure and has a much better supply of educated manpower than many other emerging African countries.¹⁶

3.5 Investment by the Private Sector

Besides the substantial investment by the public sector from revenue derived

¹⁵ Kyesimira, loc. cit., p. 11.

¹⁶ Walker, loc. cit., p. 589.

from agricultural exports, it is reasonable to expect that the African farmers would devote part of their income from these crops to investment. In any agricultural community the most important element of capital is land and so the farmers would normally invest their money in increasing the productive capacity of their land. The productive capacity of land can be increased by bringing new land into cultivation and by improving the quality of land through land improvement. However since no market for land exists, it is difficult to estimate the extent of capital investment made in land. The increase in area under cultivation and the substantial growth in agricultural export volume however clearly indicates that there has been considerable investment in land.

Another major investment in the agricultural sector has been in housing. The quality and durability of the houses of the African farmers have improved substantially during the period. Instead of having houses built of mud and thatched roof, more use is being made of building blocks and corrugated iron sheets. The investment in housing however also cannot be estimated. This is because the Statistical Division of the Uganda government does not have figures for rural housing in their gross capital formation data. However the import of around £ 700,000 worth of corrugated iron sheets annually in 1963, 1964, and 1965 indicates the substantial nature of investment in rural housing.

The increase in enrollment of students in schools throughout Uganda shows the contribution of the private sector in human capital. The investment is through the payment of school fees. Although the amount of school fees would appear

nominal in Canadian terms, these fees may form 5 to 10 per cent of the cash receipts of an average farmer.

The increase in agricultural exports has also contributed to investment in the other sectors of the monetary economy through forward linkages. The increase in the through-put of cotton ginning and coffee processing would indicate substantial investment in these two processing industries. Part of these investment funds came from the ploughing back of profits from these industries.

There are also backward linkages of development in agricultural exports. The resulting growth in the purchasing power of the African farmers has made possible the establishment of some manufacturing industries to cater to the farmers' needs. Commerce and trade has also developed rapidly due to this increase in the purchasing power of the farmers. The growth in agricultural exports has encouraged foreign investment in these two sectors.

3.6 Summary

This chapter has examined the benefits that Uganda has received through specialization in agricultural exports. These exports provide the major source of cash income for Uganda farmers. This contribution is very important in a country in which over 90 per cent of the population depends on farming. Taxes on agricultural products also play an important role since they provide the government with one of the main sources of revenue. In an underdeveloped country, where the government is the major investor, such contribution plays a significant part in

economic development. The marketing boards, through the Price Assistance Funds, have also played an important role in providing funds for building the infrastructure of the country. There has also been significant investment by the private sector from income derived from agricultural exports.

CHAPTER IV

REPERCUSSIONS OF AGRICULTURAL EXPORT INSTABILITY ON UGANDA'S DOMESTIC ECONOMY ¹

Uganda is a typical example of an underdeveloped country that is highly dependent on agricultural export earnings. This reliance on export earnings may have exposed the country to considerable unstable external influences which have been prevailing in the world export markets. MacBean², discussing Uganda, states that the country's economic characteristics are such that export instability seems certain to have repercussions on the domestic economy. This chapter will therefore investigate the degree of short run instability in agricultural export proceeds that has existed in the period 1950-1968 and will try to determine its impact on a selected set of variables in Uganda's economy. It is necessary to determine the repercussions since it would influence our decision in choosing an optimum strategy for developing the country.

¹ This section is partly based on a study done by F. Ojow at the Makerere Institute of Social Research. Refer F. Ojow, "Export Instability in Uganda's Economy." University of East Africa Social Sciences Council Conference 1968/69 Economic Papers (Kampala: Makerere Institute of Social Research, 1969), p. 171 - 182.

² MacBean, loc. cit., p. 131 - 150.

4.1 Degree of Export Instability

To determine the degree of agricultural export instability, average annual percentage deviations in the value of the exports from a five year moving average were calculated. This method to determine the short-term export instability has been recommended by MacBean.³ The method adjusts for trend and therefore eliminates the possibility that a constant increase or decrease of agricultural exports is regarded as an indicator of instability.

Table 1 shows the percentage deviation in the value of agricultural exports from a five year moving average. The average absolute annual percentage deviation for the period 1952 - 1966 is 8.26. The deviation varies from a negative high of £ 8.9 million in 1953 to a positive high of £ 7.5 million in 1952.

The above results show that Uganda has suffered substantial instability in the export proceeds of her agricultural products. Such instability is likely to have considerable effect on the domestic economy. A windfall gain of £ 8.9 million can be a blessing but a similar unexpected loss can create tremendous hardship.

To determine the cause of fluctuation in agricultural exports, the following two equations were tested using the value, quantity and prices indices given in Table 2.

³ Ibid., p. 345.

TABLE 1
INSTABILITY OF AGRICULTURAL EXPORTS

Year	Agricultural Exports £ m	Agricultural Exports £ m	AE - \hat{AE} £ m	Percentage Change
1950	25.8			
1951	43.7			
1952	43.2	35.7	7.5	21.0
1953	29.4	38.3	-8.9	-23.2
1954	36.6	37.0	-0.4	- 1.1
1955	38.7	36.6	2.1	5.7
1956	37.0	38.8	-1.8	- 4.6
1957	41.1	38.8	2.3	5.9
1958	40.8	38.1	2.7	7.1
1959	36.3	37.4	-1.1	- 2.9
1960	35.1	35.5	-0.4	- 1.1
1961	33.5	36.3	-2.8	- 7.7
1962	32.0	40.1	-8.1	-20.2
1963	44.8	43.3	1.5	3.5
1964	54.9	47.7	7.2	15.1
1965	51.1	52.2	-1.1	- 2.1
1966	55.8	54.3	1.5	2.8
1967	54.6			
1968	55.3			
Absolute Average Change				8.26

\hat{AE} : 5 year moving average of agricultural exports.

AE : Agricultural exports in £ Million.

$$\text{Value Index} = a + b (\text{Quantity Index})$$

$$\text{Value Index} = a + b (\text{Price Index})$$

The above two equations gave the following results:

$$\text{VI} = 47.17 + 0.76\text{QI}; \quad r^2 = 0.506$$

(0.194)

$$\text{VI} = 91.55 + 0.22\text{PI}; \quad r^2 = 0.047$$

(0.252)

VI = export value index

QI = export quantity index

PI = export price index

The results show that agricultural export proceeds depend more upon the volume of exports than on their price. The coefficient of determination and the beta coefficient for the second equation were both not significantly different from zero.

TABLE 2

UGANDA: AGRICULTURAL EXPORT INDICES 1950-66

Base 1960 - 62 = 100			
Year	Value Index	Quantity Index ^a	Price Index ^b
1950	77	65	119
1951	131	70	187
1952	129	72	179
1953	88	65	135
1954	109	77	141
1955	116	81	143

Table 2 (Continued)

Base 1960 - 62 = 100			
Year	Value Index	Quantity Index ^a	Price Index ^b
1956	110	85	130
1957	123	89	138
1958	122	94	130
1959	108	97	112
1960	105	105	100
1961	100	101	99
1962	96	94	102
1963	134	127	106
1964	164	120	137
1965	152	130	117
1966	167	141	118

^a Laspeyre Quantity Index

^b Paasche index

Source: Y. Kyesimira, Agricultural Export Development (Nairobi: East African Publishing House, 1969), p. 45.

In the above results, changes in the price level may have been offset by changes in the quantity of exports. The results are in a way misleading since one may draw the conclusion that price level changes are not of much importance.

To determine whether price instability is present the average annual percentage deviation in the agricultural export price index was calculated for the period 1950 - 1966. The price level deviation varied from a positive high of 15.6

per cent in 1951 to a negative high of 11.0 per cent in 1953. The average absolute annual percentage deviation was 5.63 per cent. (See Table 3).

The average annual percentage deviation in the agricultural export quantity index is smaller than that of the price index. Table 4 shows that the quantity index varied from a positive high of 11.7 per cent in 1963 to a negative high of 12.4 per cent in 1962. The average annual percentage deviation was 3.63 per cent.

Thus we can see that price instability has been greater than quantity instability. However the effect of the price instability on agricultural export proceeds have been counterbalanced by changes in the quantity.

Agricultural exports have grown considerably in the last few years. In 1950 earnings from agricultural exports were £ 25.8 million but by 1968 they have increased to £ 55.32 million. To identify the growth pattern in the amount of agricultural exports, the following regression equation was used:

$$\text{Agricultural Export Proceeds} = a + b \text{ Time}$$

where time is the year for which the agricultural export proceeds is required.

The regression equation gave the following results:

$$\text{Agricultural Export Proceeds} = -25.83 + 1.14 \text{ Time}; \quad r^2 = .488 \\ (0.284)$$

The above results indicate that 48.8% of the valuation in agricultural export proceeds could be explained by the passing of time and that exports have grown by £ 1.14 million per year.

TABLE 3
INSTABILITY OF AGRICULTURAL EXPORT PRICE
INDEX

Year	Price Index	Moving Average ^a of Price Index	Difference	Percentage Change
1950	119			
1951	187	161.7	25.3	15.6
1952	179	167.0	12.0	7.2
1953	135	151.7	-16.7	-11.0
1954	141	139.7	1.3	0.9
1955	143	138.0	5.0	3.6
1956	130	137.0	- 7.0	- 5.1
1957	138	132.7	5.3	4.0
1958	130	126.7	3.3	2.6
1959	112	114.0	- 2.0	- 1.7
1960	100	103.7	- 3.7	- 3.6
1961	99	100.3	- 1.3	- 1.3
1962	102	102.3	- 0.3	- 0.3
1963	106	115.0	- 9.0	- 7.8
1964	137	120.0	17.0	14.2
1965	117	124.0	- 7.0	- 5.6
1966	118			

Average absolute percentage change 5.63

^a 3 year moving average

TABLE 4
INSTABILITY OF AGRICULTURAL EXPORT QUANTITY
INDEX

Year	Quantity Index	Moving Average ^a of Quantity Index	Difference	Percentage Change
1950	65			
1951	70	69.0	1.0	1.4
1952	72	69.0	3.0	4.3
1953	65	71.3	-6.3	-8.8
1954	77	74.3	2.7	3.6
1955	81	81.0	0.0	0.0
1956	85	85.0	0.0	0.0
1957	89	89.3	-0.3	-0.3
1958	94	93.3	0.7	0.7
1959	97	98.6	-1.6	-1.6
1960	105	101.0	4.0	4.0
1961	101	100.0	1.0	1.0
1962	94	107.3	-13.3	-12.4
1963	127	113.7	13.3	11.7
1964	120	125.7	-5.7	-4.5
1965	130	130.3	-0.3	-0.2
1966	141			
	Average	Absolute	Change	3.63

^a 3 year moving average

4.2 Empirical Observations

To indicate the association between agricultural exports and other economic variables, a number of regressions have been run. While the results of these regressions are published, the reader is advised that these regression results do not, in any sense, constitute proof of a cause-effect relationship between agricultural exports and the other variables studied. Instead, they only suggest that such cause and effect relationships are not obviously contradicted by extant statistical data.

The regression results are inconclusive for two reasons. First, the observation of the data suggest that collinearity may exist and that the relationships may therefore be spurious.

Secondly, the relationships are not supported by a precisely causal model, but only a very broad conjecture of the cause-effect relation. Therefore, even a more defensible statistical association than that presented here would not, by itself, be sufficient for the inference of a causal linkage; indeed there are possibilities that the direction of causation could be the reverse of that conjectured here.

4.3 Effect on Gross Domestic Product

Fluctuations in agricultural export earnings will have a direct effect on the monetary gross domestic product since the former forms a substantial proportion of the latter. Also there will be indirect effect of changes in export proceeds which stimulates the development and use of other economic inputs. In addition

to real effects, the export fluctuations could also induce domestic monetary effects.

The East African Currency Board during this period did not allow the use of monetary policy to stabilize the economy. This was because the East African Currency had to be fully backed by sterling. Money supply depended upon the foreign exchange reserve of the Currency Board.⁴

To observe the association of agricultural exports and monetary gross domestic products, a simple regression equation was fitted to the data. This gave the following results:

$$\text{GDP}_t = -63.10 + 4.67X_t; \quad r^2 = 0.702$$

(0.738)

where: GDP_t = monetary gross domestic product time t .

X_t = agricultural export proceeds time t .

The results show a significant relationship between the two. About 70.2 per cent of changes in gross domestic product could be explained by agricultural export proceeds.

Since agricultural export proceeds form part of the monetary gross domestic product, it was decided to eliminate the former from the monetary gross

⁴ The East African Currency Board was established in 1919 and was charged with the issue and redemption of an East African currency for Kenya, Uganda, Tanganyika and later (in 1935) Zanzibar. The East African shilling was freely convertible on demand into sterling at a fixed exchange rate. Since the Currency Board was required to fully back the shilling with sterling assets, East Africa was merely an extension of the United Kingdom currency area. The Board did not therefore have the right to use monetary policy to stabilize the local economy. In 1966 the Currency Board was disbanded and central banks for each of the three countries were formed. It is expected that the new Bank of Uganda would try to stabilize the domestic economy through monetary measures.

domestic product figures.

When the regression equation was applied to the new figures, the results were as following:

$$GDP_t^* = -45.53 + \frac{3.33X_t}{(0.906)} ; \quad r^2 = 0.443$$

GDP^* = monetary gross domestic product minus agricultural export proceeds.

The relationship between GDP^* and agricultural export earnings is still significant. The runs test however shows that there is serial correlation in the time series data.

In the above equation only the primary influence of agricultural exports on the gross domestic product have been examined. There may also be some delayed influence. This is because some time lapse is required before the full impact of the exports is felt on the economy. When a time lag of one year was introduced in the former equation, the following results were obtained:

$$GDP_t^* = -60.10 + \frac{1.89X_t}{(1.270)} + \frac{1.87X_{t-1}}{(1.200)} \quad R^2 = 0.516$$

The above results show a greater degree of association between agricultural exports and GDP^* . However the time series data has serial correlation in it. Moreover the two beta coefficients are not significantly different from zero. Therefore caution must be exercised when interpreting the above equation.

An association of agricultural exports to the monetary gross domestic product could mean that any changes in the former will have repercussions on the

latter. MacBean⁵, although acknowledging that the domestic income of Uganda has fluctuated in sympathy with export earnings, states that the degree of instability in gross domestic product was not unduly severe. His conclusion cannot be supported by the results obtained in this study. The high association of agricultural exports to monetary gross domestic product and the high agricultural export instability index clearly implies that agricultural export instability will lead to instability in gross domestic product.

4.4 Effect on Imports

Since export earnings is one of the main sources of income and foreign exchange, it is expected that there should be close relationships between the level of imports and the level of agricultural exports.

To test the above relationship, a simple regression equation was fitted to the data. This gave the following results:

$$\text{Imports}_t = 1.0 + 0.69X_t; \quad r^2 = 0.698$$

(0.111)

The results show a significant association of the two variables.

The above regression equation is based on a simplistic model regarding the variable(s) determining the level of imports. This is because the level of imports is also affected by the level of GDP*. Therefore this variable was introduced in the regression equation. This gave the following results:

⁵ MacBean, loc. cit., p. 148.

$$\text{Imports}_t = 4.567 + 0.078 \text{GDP}_t^* + 0.434X_t; \quad R^2 = .821$$

(0.0235) (0.1177)

The above regression equation gives a better fit than when gross domestic product or agricultural exports proceeds is introduced alone in the regression equation.

The above equation suggests that imports increase by 43.4 per cent of the value of any increase in agricultural exports. On the otherhand, increase in GDP* increases imports by only 7.8 per cent of its value.

The above equation does not take into account the time lag between the placing of orders and the arrival of imports from abroad. Therefore a one year time lag for agricultural exports was introduced in the above equation. This gave the following results.

$$\text{Imports} = 1.26 + 0.057\text{GDP}_t^* + 0.273X_t + 0.301X_{t-1}; \quad R^2 = .881$$

(0.0213) (0.115) (0.110)

The results show an increase in association. It appears that imports of the current year are determined more by agricultural export proceeds of the previous year rather than the current year.

4.5 Effect on Investment

A significant proportion of capital formation consists of imports of capital goods. Since these imports require foreign exchange, one expects significant association between agricultural exports and imports of capital goods. The regression equation for this relationship is as following:

$$M_t^k = -5.41 + 0.35X_t ; \quad r^2 = .701$$

(0.056)

M_t^k = import of machinery and transport equipment.

As expected, there is a significant association between the two variables.

When GDP* was introduced in the above regression equation, the following results were obtained:

$$M_t^k = 3.77 + 0.036 \text{GDP}_t^* + 0.235 X_t ; \quad R^2 = 0.802$$

(0.0126) (0.0630)

The above regression equation provides a better fit. The above equation suggests that the percentage of agricultural export proceeds spent on import of capital goods is greater than the percentage for GDP*.

There is usually a time lag between income and investment decision. Therefore one should expect a time lag in the import of capital goods. To test this a time lag of a year was introduced for the agricultural export proceeds. This gave the following results:

$$M_t^k = -5.77 + 0.023 \text{GDP}_t^* + 0.137 X_t + 0.182 X_{t-1} ; \quad R^2 = .886$$

(0.010) (0.0573) (0.0546)

The results show a significant increase in the association of the variables. As expected, agricultural exports of the previous year are more important in determining this year's import of capital goods.

So far only the relationship between imports of capital goods and the independent variables were examined. However there is also a significant amount of other capital formation. The relationship between gross capital formation and the

independent variables was therefore examined. The results were as following:

$$GCF_t = -0.65 + 0.072 GDP^* + 0.379 X_t; \quad R^2 = .729$$

(0.028) (0.138)

GCF = gross capital formation

The results show a lesser association between gross capital formation and the independent variables than between import of capital goods and the two independent variables. This would appear normal since local investments do not require the foreign exchange earned by agricultural exports.

The above equation also suggests that the percentage of agricultural export proceeds spent on capital formation is greater than the percentage for GDP*.

When a time lag of one year in agricultural export proceeds was introduced, the relationship changed significantly. The beta coefficient for X_t was not significantly different from zero. This suggests that export proceeds of the previous year determines the level of investment in the current year. The results of this relationship are shown below:

$$GCF_t = -5.65 + 0.040 GDP^* + 0.135 X_t + 0.456 X_{t-1}; \quad R^2 = .879$$

(0.0204) (0.1108) (0.1056)

From the above results, one can deduce the importance of agricultural exports to investment. Changes in the former will affect the latter. This may have a further multiplier effect on the domestic economy.

4.6 Effect on Government Revenue

Export taxes on agricultural products contribute heavily to government

revenue. Moreover agricultural proceeds enables the import of commodities which are subject to import taxes. Therefore there has to be significant relationship between the agricultural exports and government revenue.

The following equation was used to examine the relationship between government revenue and agricultural exports.

$$GR_t = a + bX_t$$

GR = government revenue

This gave the following results:

$$GR_t = -18.28 + 0.94X_t; \quad r^2 = 0.758$$

(0.129)

The results show a significant relationship between the two.

When a one year time lag was introduced in the above equation because of the time lag in imports, the following results were obtained.

$$GR_t = -21.18 + 0.66X_t + 0.37_{t-1}; \quad R^2 = .82$$

(0.167) (0.159)

The above results show an increase in the association of the two variables.

When GDP* was introduced in the above two equations, the following results were obtained:

$$GR_t = -13.15 + 0.112 GDP_t^* + 0.569X_t \quad R^2 = 0.908$$

(0.022) (0.1099)

$$GR_t = -15.21 + 0.099 GDP_t^* + 0.469X_t + 0.188X_{t-1}; \quad R^2 = 0.922$$

(0.1217) (0.1159)

The above results show an increase in association between government revenue and the independent variables of the two equations. However we have to eliminate the second equation since the beta coefficient for X_{t-1} is not significantly different from zero.

The above equation suggests that earnings from the agricultural export sector is more important in generating government revenue than income from other sectors. Therefore any fluctuations in agricultural export earnings will have impact on government revenue. This may influence government expenditure whose effect would then be felt throughout the economy.

4.7 Effect on Export Taxes on Agricultural Commodities

Since export taxes depend directly upon agricultural export proceeds, one would expect almost a perfect relationship between them. To determine the extent of their relationship, the following equation was used:

$$AGTAX_t = a + bX_t$$

AGTAX = agricultural export tax

The equation when applied gave the following results:

$$AGTAX = -1.06 + 0.17X_t; \quad r^2 = 0.604$$

The above results are not as significant as expected. This is because while export earnings are a function of price and volume of exports, the rate of export taxation in Uganda depends solely on the price of exports. Therefore the relationship between agricultural export taxes, the export price index of agricultural

products and the volume index was examined using the following equation:

$$\text{AGTAX} = a + b\text{PI} + c\text{QI}$$

PI = Export price index for agricultural products

QI = Export volume index for agricultural products

The results were as following:

$$\text{AGTAX} = -10.24 + 0.05\text{QI} + 0.08\text{PI}; \quad R^2 = 0.842$$

(0.010) (0.010)

The above results show a significant association between agricultural export taxes and the two indices. The price index appears to be more important in determining the amount of export taxes collected.

4.8 Effect on Marketing Board Surplus

Like agricultural export taxes one would expect a significant relationship between the marketing board surplus and agricultural export proceeds. However the following results were surprising:

$$\text{MBS}_t = 5.92 - 0.11\text{X}_t; \quad r^2 = 0.04$$

(0.132)

where MBS = marketing board surplus or deficit of the year from operations.

There seems to be no relationship between the two variables. This is because the annual surplus or deficit is determined mainly by the prices obtained from export. The relationship between the marketing board surplus and the agricultural price index was therefore examined. This gave the following results:

$$\text{MBS}_t = -17.99 + 0.15\text{PI}; \quad r^2 = 0.559$$

(0.035)

PI = agricultural export price index

The above results show a significant relationship between the two variables. Marketing board net surpluses seems to be more dependent upon agricultural export prices. The relationship might have been still closer if a log function had been used.

4.9 Income to Farmers

Cotton and Coffee comprise around eighty per cent of agricultural export earnings. Most of these two products are produced by peasant farmers. Therefore one would expect that the income they derive from cotton and coffee would be closely dependent on the agricultural export proceeds. To determine the relationship between these two variables, the following equation was used:

$$AFGRO = a + bX_t$$

where AFGRO = Receipts of African growers from cotton and coffee, i.e. Export proceeds less net government impact and minus marketing and processing costs. The results were as following:

$$AFGRO = 3.09 + 0.48X_t ; \quad r^2 = 0.452 \\ (0.129)$$

The results are surprising. The income of African farmers does not seem to be that closely related to agricultural export proceeds. This may be due to the progressive taxes on agricultural products and the working of the marketing boards.

The Price Assistance Funds were established to insulate the incomes of the farmers from the full impact of fluctuations in world prices for their crops.⁶ To

⁶ MacBean, loc. cit., p. 142.

determine whether the working of these funds have stabilized the farmers' income, the average annual percentage deviation of farmers' income from a five year moving average was computed. The results shown in Table 5, shows that the deviation varied from a positive high of 25.1 per cent in 1955 to a negative high of 25.4 per cent in 1962. The mean annual percentage deviation is 9.49. This is higher than the mean annual percentage deviation of 8.26 for agricultural export proceeds. Therefore one can conclude that the Price Assistance Funds have failed in their function of stabilizing farmers' income.

There are two Price Assistance Funds in Uganda, the Coffee and the Cotton Fund. Each fund is being administered by its respective marketing board. Perhaps, one of them might be doing a better job at stabilizing the income of the African farmers. To determine this, the instability of the export proceeds of each crop was compared to the instability index of the receipts of farmers from that crop.

Table 6 shows the annual percentage deviation of coffee export proceeds from a three year moving average of the same. The average annual percentage deviation for the period is 8.5. On the otherhand, the average annual percentage deviation of the income of African farmers from coffee is 9.98 (Table 7). Therefore one can conclude that the Coffee Marketing Board, instead of stabilizing the farmers' income, may have increased the instability.

The average annual percentage deviation for cotton export proceeds is 11.81 (Table 8). This is lower than the instability index of 12.69 for the income of cotton farmers (Table 9). Therefore the Lint Marketing Board has also failed in its task of stabilizing the income of the farmers.

TABLE 5
INSTABILITY OF FARMERS' CASH RECEIPTS FROM COTTON
AND COFFEE

Year	Farmers' Receipts £ m	Farmers' Receipts £ m	FR - \hat{FR} £ m	Percentage Change
1950	9.37			
1951	13.98			
1952	16.26	15.39	0.87	5.7
1953	16.10	19.04	-2.94	-15.4
1954	21.22	20.63	0.59	2.9
1955	27.65	22.11	5.54	25.1
1956	21.92	23.81	-1.89	- 7.9
1957	23.65	24.65	-1.00	- 4.1
1958	24.60	23.93	0.67	2.8
1959	25.45	24.01	1.44	6.0
1960	24.02	22.86	1.16	5.1
1961	22.32	23.28	-0.96	- 4.1
1962	17.91	24.02	-6.11	-25.4
1963	26.68	26.12	0.56	2.1
1964	29.18	28.90	0.28	1.0
1965	34.50	30.41	4.09	13.4
1966	36.21	20.82	6.39	21.4
1967	25.47			
1968	23.75			
Average absolute percentage change				9.49

FR = Farmers' cash receipts in £ million from coffee and cotton.

\hat{FR} = 5 Year moving average of farmers' receipts.

TABLE 6
INSTABILITY OF EXPORT PROCEEDS FROM COFFEE

Year	Coffee Exports £ m	Coffee $\hat{C}E$ Exports £ m	CE - $\hat{C}E$ £ m	Percentage Change
1950	8.33			
1951	13.65	11.54	2.11	18.28
1952	12.64	12.61	0.03	0.24
1953	11.54	12.55	-1.01	- 8.05
1954	13.48	15.05	-1.57	-10.43
1955	20.13	16.44	3.69	22.44
1956	15.72	19.15	-3.43	-17.91
1957	21.59	19.38	2.21	11.40
1958	20.83	20.37	0.46	2.26
1959	18.69	18.84	-0.15	- 0.80
1960	16.99	16.55	0.44	2.66
1961	13.98	17.05	-3.07	-18.01
1962	20.17	20.44	-0.27	- 1.32
1963	27.18	27.58	-0.40	- 1.45
1964	35.38	30.99	4.39	14.17
1965	30.42	33.53	-3.11	- 9.28
1966	34.78	33.27	1.51	4.54
1967	34.60	35.04	-0.44	- 1.26
1968	35.75			

Average absolute percentage change 8.5

CE : coffee exports

$\hat{C}E$: 3 year moving average of coffee exports

TABLE 7

INSTABILITY OF CASH RECEIPTS OF AFRICAN FARMERS
FROM COFFEE

Year	Coffee Income £ m	Coffee \hat{CI} Income £ m	$CI - \hat{CI}$ £ m	Percentage Change
1950	2.04			
1951	3.61	3.33	0.28	8.41
1952	4.33	4.56	-0.23	-5.04
1953	5.73	6.12	-0.39	-6.37
1954	8.29	10.03	-1.74	-17.35
1955	16.07	11.23	4.84	43.10
1956	9.34	11.99	-2.65	-22.10
1957	10.57	10.57	0.00	0.00
1958	11.81	12.04	-0.23	- 1.91
1959	13.73	13.01	0.72	5.53
1960	13.50	12.32	1.18	9.58
1961	9.74	11.68	-1.94	-16.61
1962	11.80	11.93	-0.13	- 1.09
1963	14.25	15.04	-0.79	- 5.25
1964	19.07	17.70	1.37	7.74
1965	19.79	19.73	0.06	0.30
1966	20.34	18.48	1.86	10.06
1967	15.30	16.86	-1.56	- 9.25
1968	14.93			

Average absolute percentage change 9.98

CI : Income of African farmers from coffee

\hat{CI} : 3 year moving average of income from coffee

TABLE 8

INSTABILITY OF EXPORT PROCEEDS FROM COTTON

Year	Cotton Exports £ m	Cotton $\hat{C}E$ Exports £ m	CE - $\hat{C}E$ £ m	Percentage Change
1950	16.70			
1951	28.74	25.13	3.61	14.37
1952	29.95	25.16	4.79	19.04
1953	16.80	22.54	-5.74	-25.47
1954	20.88	18.02	2.86	15.87
1955	16.38	18.85	-2.47	-13.10
1956	19.29	17.72	1.57	8.86
1957	17.48	18.30	-0.82	-4.48
1958	18.14	17.02	1.12	6.58
1959	15.43	16.17	-0.74	-4.58
1960	14.93	15.69	0.76	4.84
1961	16.72	13.30	3.42	25.71
1962	8.26	13.10	-4.84	-36.95
1963	14.33	12.82	1.51	11.78
1964	15.86	15.65	0.21	1.34
1965	16.76	15.99	0.77	4.82
1966	15.35	15.76	-0.41	-2.60
1967	15.16	15.10	0.06	0.40
1968	14.78			
Average absolute percentage change				11.81

CE : Cotton exports

$\hat{C}E$: 3 year moving average of cotton exports

TABLE 9
INSTABILITY OF CASH RECEIPTS OF AFRICAN FARMERS
FROM COTTON

Year	Cotton Income £ m	Cotton $\hat{C}I$ Income £ m	$CI - \hat{C}I$ £ m	Percentage Change
1950	7.33			
1951	10.37	9.88	0.49	4.96
1952	11.93	10.89	1.04	9.55
1953	10.37	11.74	-1.37	-11.67
1954	12.93	11.63	1.30	11.18
1955	11.58	12.36	-0.78	- 6.31
1956	12.58	12.41	0.17	1.37
1957	13.08	12.82	0.26	2.03
1958	12.79	12.53	0.26	2.08
1959	11.72	11.68	0.04	0.34
1960	10.52	11.61	-1.09	- 9.39
1961	12.58	9.74	2.84	29.16
1962	6.11	10.37	-4.26	-41.08
1963	12.43	9.55	2.88	30.16
1964	10.11	12.42	-2.31	-18.60
1965	14.71	13.56	1.15	8.48
1966	15.87	13.58	2.29	16.86
1967	10.17	11.62	-1.45	-12.48
1968	8.82			
Average absolute percentage change				12.69

CI : Income of African farmers from cotton.

$\hat{C}I$: 3 year moving average of income from cotton.

One may argue that the marketing boards are trying to stabilize prices paid to the farmers rather than their income. This is because the marketing boards are in no position to stabilize income since in the past they had to announce prices before the season had started. At that time they do not know the volume of production.

To determine whether the Marketing Boards have stabilized prices paid to the farmers, the instability of the unit value of each export crop is compared to the instability of the prices paid to the farmers for that crop.

Table 10 shows the annual percentage deviation of coffee export unit value from a three year moving average. The average annual percentage deviation is 6.72. On the otherhand, the instability index for producer's prices for coffee is 6.94 (Table 11). Therefore we can conclude that the Coffee Marketing Board has failed in their second function of stabilizing prices paid to the farmers.

Looking at cotton, the average annual percentage deviation of cotton export unit value is 4.58 (Table 12). This is also lower than the instability index of 5.25 for the prices paid to the African farmers (Table 13). The Lint Marketing Board has also failed in stabilizing the prices paid to the cotton farmers.

The instability of producer prices as computed in the tables do not really reflect the true instability faced by the farmers. This is especially true for coffee farmers. The coffee producer price shown in Table 11 is the government announced minimum purchase price. However the actual price may be different. Also the actual price may fluctuate greatly within a given season.

TABLE 10
INSTABILITY OF UNIT VALUE OF COFFEE
EXPORTS

Year	Coffee Export Unit Value (£ per ton)	Coffee $\hat{C}E$ Export Unit Value (£ per ton)	CE - $\hat{C}E$ £	Percentage Change
1950	261			
1951	278	238.7	-5.7	-2.01
1952	312	304.3	7.7	2.53
1953	323	341.0	-18.0	-5.28
1954	388	327.0	61.0	18.65
1955	270	304.3	-34.3	-11.27
1956	255	260.7	-5.7	-2.19
1957	257	258.3	-1.3	-0.50
1958	263	243.3	19.7	8.10
1959	210	205.7	4.3	2.09
1960	144	163.0	-19.0	-11.66
1961	135	144.3	-9.3	-6.44
1962	154	158.7	-4.7	-2.96
1963	187	199.3	-12.3	-6.17
1964	257	213.3	43.7	20.49
1965	196	221.3	-25.3	-11.43
1966	211	209.0	2.0	0.96
1967	220	223.3	-3.3	-1.48
1968	239			
Average absolute percentage change				6.72

CE : Coffee export unit value

$\hat{C}E$: 3 year moving average of coffee unit value

TABLE II
INSTABILITY OF PRICE PAID TO PRODUCERS FOR COFFEE

Year	Producer Price for Coffee (cts/lb.)	Producer \hat{P} Price for Coffee (cts/lb.)	PPC - \hat{P} PPC (cts.)	Percentage Change
1950	25			
1951	40	38.3	1.7	4.44
1952	50	53.3	-3.3	6.19
1953	70	73.3	-3.3	4.50
1954	100	98.3	1.7	1.73
1955	125	100.0	25.0	20.00
1956	75	93.3	-18.3	19.61
1957	80	78.3	1.7	2.17
1958	80	76.0	4.0	5.26
1959	68	68.0	0.0	0.00
1960	56	58.0	-2.0	3.45
1961	50	53.7	-3.7	6.89
1962	55	51.0	4.0	7.84
1963	48	53.3	-5.3	9.94
1964	57	49.3	7.7	15.62
1965	43	46.7	-3.7	7.92
1966	40	41.0	-1.0	2.44
1967	40	40.0	0.0	0.00
Average absolute percentage change				6.94

PPC : Producer price for coffee

\hat{P} PPC : 3 year moving average of producer price for coffee.

TABLE 12

INSTABILITY OF UNIT VALUE OF COTTON EXPORTS

Year	Cotton Export Unit Value (£ per 100 lb)	Cotton \hat{E} Export Unit Value (£ per 100 lb)	CE - \hat{CE}	Percentage Change
1950	12.0			
1951	20.8	17.5	3.3	18.86
1952	19.8	17.7	2.1	11.86
1953	12.6	15.2	-2.6	17.10
1954	13.3	13.1	0.2	1.53
1955	13.4	13.2	0.2	1.51
1956	12.8	13.1	-0.3	2.29
1957	13.0	12.5	0.5	4.00
1958	11.7	11.7	0.0	0.00
1959	10.3	11.1	-0.8	7.21
1960	11.3	11.2	0.1	0.89
1961	12.0	11.6	0.4	3.45
1962	11.4	11.4	0.0	0.00
1963	10.9	11.2	-0.3	2.68
1964	11.2	11.0	0.2	1.82
1965	11.0	11.0	0.0	0.00
1966	10.7	10.7	0.0	0.00
1967	10.3	10.8	-0.5	4.63
1968	11.4			
Average absolute percentage change				4.58

CE : Cotton export unit value

\hat{CE} : 3 year money average of cotton export unit value

TABLE 13
INSTABILITY OF PRICE PAID TO PRODUCERS FOR
COTTON

Year	Producer Price for Cotton (cts./lb.)	Producer $\hat{P}C$ Price for Cotton (cts./lb.)	PC - $\hat{P}C$	Percentage Change
1950	31.8			
1951	43.1	40.8	2.3	5.64
1952	47.6	46.4	1.2	2.59
1953	48.6	48.5	0.1	0.21
1954	49.4	52.3	-2.9	5.54
1955	58.8	53.4	5.4	10.11
1956	52.1	54.7	-2.6	4.75
1957	53.3	53.4	-0.1	0.19
1958	54.9	50.8	4.1	8.07
1959	44.2	48.0	-3.8	7.92
1960	44.8	47.1	-2.3	4.88
1961	52.2	49.7	2.5	5.03
1962	52.1	52.1	0.0	0.00
1963	52.1	52.6	-0.5	0.95
1964	53.6	54.1	-0.5	0.92
1965	56.5	56.7	-0.2	0.35
1966	60.0	52.2	7.8	14.94
1967	40.0	48.3	-8.3	17.18
1968	45.0			
Average absolute percentage change				5.25

PC : Producer for cotton

$\hat{P}C$: 3 year moving average of producer price for cotton.

Table 14 shows that the price for KIBOKO coffee varies greatly not only from year to year but also from month to month, while the minimum purchase price has been 40 cents throughout the period. If the actual prices were used to compute the instability index, the degree of instability would have been much greater.

TABLE 14

PRICE IN CENTS FOR ONE POUND OF KIBOKO COFFEE PAID IN MASAKA DISTRICT

Year	May	June	July
1966	40-50	50-55	55-60
1967	40-45	30-40	30-60
1968	50-53	53-56	50-56

Source: A.H. Jiwani, "The Problem of Coffee Marketing and Processing in Masaka District," (Department of Economics, Makerere University, 1969) (Mimeographed).

The two Marketing Boards have failed to accomplish either price or income stabilization. Instead of moderating the impact of world fluctuations, they have aggravated the situation. The wide repercussions of agricultural export instability on various sectors of the domestic economy might be partly due to the failure of the Marketing Boards to perform the two primary functions of any marketing board i.e. price and income stabilization.

4.10 CONCLUSION

This chapter has investigated the possible impact of agricultural export instability on selected variables in Uganda's economy. The results have suggested that agricultural export proceeds may be closely related to all the variables in the domestic economy. This close association could imply that the changes in the export proceeds will result in changes in the other variables. Accordingly, there may be an advantage in stabilizing the agricultural export proceeds. This can be done partly through the keeping of buffer stocks and the use of forward market dealings.

The government could also try to reduce the impact of agricultural export instability on the domestic economy. One of the methods that the government can use to reduce the impact is through stabilization of incomes of the farmers. The two Marketing Boards could make this their primary objective. Fiscal and monetary policies can also be used to reduce the repercussions of export instability on the domestic economy. A country cannot use the argument of export instability to justify reducing their reliance on exports without first trying to determine whether export instability and its effect on the domestic economy can be reduced through government action. Although in the past the government did not have the ability to use the monetary policy, this handicap does not exist with the establishment of the Bank of Uganda.

The reader, in examining the conclusion of this chapter, is cautioned to remember the limitation of these observations, as expressed in Section 4.2.

APPENDIX 1

In this section a few remarks shall be made on those aspects of correlation and regression analysis which are relevant to the previous Chapter, i.e. Chapter IV.

The principal problem of regression analysis is to estimate or predict the value of some dependent random variable on the basis of one or more known independent variables. On the otherhand, in correlation analysis the principal problem is to measure the relationship between two or more variables rather than predicting one variable from a knowledge of the independent variables. The correlation coefficient is a measure of linear relationship between two or more variables. Therefore a value of $R = 0$ implies a lack of linearity and not necessarily a lack of association.

In a regression equation if there is only one independent variable then the regression is known as simple regression. If there are several independent variables then the regression is known as multiple regression.

In a simple linear regression the relationship between independent variable X and the dependent variable Y can be represented by the equation:

$$Y_i = \alpha + \beta X_i + e_i$$

where α is a constant term, β is the unknown true regression coefficient and e is a random term.

For a random sample of n observations the regression line, which is an estimate of the true value of Y , can be given by:

$$Y^* = a + bX$$

The value of the parameters a and b i.e. the estimate of α and β , are computed such that the sum of the squares of the residuals is a minimum. This minimization procedure for estimating the parameters is called the method of least squares.

In a multiple regression the relationship between the independent variables X_1, X_2, \dots, X_k and the dependent variable Y can be represented by the equation:

$$Y_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \dots + \beta_k X_k + e_i$$

For our time series the estimated regression line can be given by:

$$Y^* = a + bX_1 + cX_2 + dX_3 + \dots + lX_k$$

To determine the significance of the correlation coefficient and the regression equation the following tests were used:

1. Test of Hypothesis concerning β

The estimate(s) for parameter β are tested by using the following hypothesis:

$$H_0 : \beta = 0$$

$$H_1 : \beta > 0$$

A 0.05 level of significance is chosen.

Critical region: $T > 1.740$ using 17 degrees of freedom

2. Test of Hypothesis concerning linearity and the significance of the correlation coefficient.

H_0 : the regression is linear

H_1 : the regression is nonlinear

A 0.05 level of significance is chosen

Critical Region

$$F \leq 4.45 \text{ for } f_{(1,17)}$$

$$F \leq 3.63 \text{ for } f_{(2,16)}$$

$$F \leq 3.29 \text{ for } f_{(3,15)}$$

3. Test for Serial or Auto-correlation

A one sample runs test was used to determine if the residuals were normally distributed. A run is defined as a succession of identical symbols (positive or negative) which are followed and preceded by different symbols or by no symbols at all. A tendency for relatively long runs of positive and negative symbols would indicate serial correlation in the residuals.

The above non-parametric test was chosen rather than a parametric test like the Durbin-Watson statistic because the latter requires the assumption of normality and homoscedasticity. On the otherhand a non-parametric test like the runs test does not require these assumptions.

The results of the F test and the Runs test are tabulated in Table 15a and Table 15b.

The regression calculations for this thesis have been performed using a set of statistical programs called STATPACK2 written in APL, an operational version

of Iverson's language, which can be used through 2741 terminals. An account of the statistical program in STATPACK2 is given by K. W. Smillie.⁶

⁶ K.W. Smillie, STATPACK2: An APL Statistical Package. Publication No. 17, Department of Computing Science, University of Alberta, Edmonton.

TABLE 15 (a)
RESULTS OF F TEST AND RUNS TEST

Regression Equation	F Ratio	Critical $F_{0.05}$ Value	No of runs	Acceptance Values for No. of runs
$X_t = -25.83 + 1.14 \text{ Time}$	16.19	$F \leq 4.45$	8	$5 < R < 15$
$GDP_t = -63.10 + 4.67X_t$	40.06	$F \leq 4.45$	6	$5 < R < 16$
$GDP_t^* = -45.53 + 3.33X_t$	13.50	$F \leq 4.45$	4 ^a	$5 < R < 15$
$GDP_t^* = -60.10 + 1.89X_t$ $+ 1.87X_{t-1}$	85.28	$F \leq 3.63$	5 ^a	$5 < R < 16$
$Imports_t = 1.0 + 0.69X_t$	39.24	$F \leq 4.45$	8	$5 < R < 16$
$Imports_t = 4.57 + 0.078GDP_t^*$ $+ 0.434X_t$	36.78	$F \leq 3.63$	6	$5 < R < 16$
$Imports_t = 1.26 + 0.057GDP_t^*$ $+ 0.273X_t + 0.301X_{t-1}$	36.99	$F \leq 3.29$	8	$5 < R < 16$
$M_t^k = -5.41 + 0.35X_t$	39.92	$F \leq 4.45$	9	$5 < R < 15$
$M_t^k = -3.77 + 0.036GDP_t^*$ $+ 0.235X_t$	32.42	$F \leq 3.63$	9	$5 < R < 16$
$M_t^k = -5.77 + 0.023GDP_t^*$ $+ 0.137X_t + 0.182X_{t-1}$	39.07	$F \leq 3.29$	7	$5 < R < 16$
$GCF_t = -0.65 + 0.072GDP_t^*$ $+ 0.379X_t$	21.49	$F \leq 3.63$	6	$5 < R < 15$
$GCF_t = -5.65 + 0.040GDP_t^*$ $+ 0.135X_t + 0.456X_{t-1}$	36.33	$F \leq 3.29$	8	$5 < R < 16$

TABLE 15 (b)

RESULTS OF F TEST AND RUNS TEST

Regression Equation	F Ratio	Critical $F_{0.05}$ Value	No. of runs	Acceptance Values for No. of runs
$GR_t = -18.28 + .94X_t$	53.28	$F \leq 4.45$	9	$5 < R < 16$
$GR_t = -21.18 + 0.66X_t$ $+ 0.37X_{t-1}$	36.53	$F \leq 3.63$	7	$5 < R < 15$
$GR_t = -13.15 + 0.112GDP_t^*$ $+ 0.569X_t$	79.30	$F \leq 3.63$	9	$5 < R < 15$
$GR_t = -15.21 + 0.099GDP_t^*$ $+ 0.047X_t + 0.188X_{t-1}$	59.11	$F \leq 3.29$	9	$5 < R < 14$
$AGTAX_t = -1.06 + 0.17X_t$	25.99	$F \leq 4.45$	6	$5 < R < 15$
$AGTAX = -10.24 + 0.05QI$ $+ 0.08PI$	37.30	$F \leq 3.74$	10	$5 < R < 14$
$MBS_t = 5.92 - 0.11X_t$	0.70	$F \leq 4.45$	6	$4 < R$
$MBS_t = -17.99 + 0.15PI$	19.03	$F \leq 4.54$	8	$5 < R < 14$
$AFGRO = 3.09 + 0.48X_t$	14.03	$F \leq 4.45$	7	$5 < R < 15$
$VI = 47.17 + 0.76QI$	15.36	$F \leq 4.54$	8	$5 < R < 14$
$VI = 91.55 + 0.22PI$	0.737 ^a	$F \leq 4.54$	4 ^a	$4 < R < 13$

^a not significant at the 5% level

CHAPTER V

TERMS OF TRADE

The second main argument presented against relying on agricultural exports for economic development is the belief that the terms of trade of the countries producing these commodities have been deteriorating over time. Let us examine if this argument is valid for Uganda.

Table 1 shows the agricultural export price index, the import price index and the terms of trade facing Uganda. The agricultural export price index has been declining over the period shown in the table. On the otherhand, the import price index has been rising slowly. As a result, the terms of trade facing Uganda have deteriorated steadily.

The import price index shows a slightly erratic movement which may not exist in reality. The erratic movement may be due to the method of calculation used by the East African Statistical Department. The Department computes the import price index on a strictly mechanical basis and therefore no unit values whatsoever are rejected no matter how great a change may have taken place from a previous year. The erratic movement can therefore be traced back to abnormal movements in the unit value. For example, the import of famine relief food at artificially low prices in 1961 - 1962 lowered the import price index. While in some other years the purchase of exceptional items like large aircrafts in a particular year may raise the import price index of that year although there may not be any real increase

TABLE 1

THE AGRICULTURAL EXPORT PRICE INDEX, THE IMPORT PRICE INDEX
AND THE TERMS OF TRADE FACING UGANDA

Year	Import Price Index ^a	Agricultural Export Price Index ^b	Terms of Trade PI ÷ XI
1950	93	84	111
1951	115	133	86
1952	123	127	97
1953	112	96	117
1954	100	100	100
1955	98	101	97
1956	101	92	110
1957	98	98	100
1958	97	92	105
1959	98	79	124
1960	103	71	145
1961	101	70	144
1962	96	72	133
1963	112	75	149
1964	109	97	112
1965	114	83	137
1966	115	84	137
1967	122	86	142
1968	109	91	120

^a Import Price Index - Laspeyre index with 1954 as base.

^b Agricultural export price index is a Paasche index with 1954 as base (transferred from 1960 - 62 base).

Source: Kyesimira, *loc. cit.*, p. 45.
Economic and Statistical Review (EASD)
Uganda Statistical Abstracts

in the prices of these items.¹

The import price index may also have a downward bias. This is because the wage bill of Africans is rising more rapidly than that of Europeans and Asians and therefore there is a general trend towards less expensive, lower quality imports.² As a result the actual terms of trade may have deteriorated more than that shown in Table 1.

To avoid the downward bias and the erratic movement of the import price index, the world export price index for manufacturing goods was used to represent the prices facing the Uganda buyer. The world export price index, as shown in Table 2, does not show any erratic movement. The price index has been raising steadily, therefore the terms of trade for Uganda have deteriorated over the period shown.

There are however some defects in the price indices which have to be taken into account before any categorical statement regarding the terms of trade for Uganda can be made. The major defect of the price indices is that they do not take into account the changes in quality that takes place over a period of time. This point is not important as far as agricultural exports is concerned since there is almost no change in quality. However, the point is of crucial importance as far as imports of manufacturing goods are concerned. Any increase in the quality of imports would

¹ J. Craig, "An East African Import Price Index 1954-63, Calculating from Supplying Countries' Export Indices," East African Economic Review, Vol. II, No.1 (June, 1965), p. 39 - 54.

² Ibid.

TABLE 2

THE AGRICULTURAL EXPORT PRICE INDEX, THE WORLD EXPORT PRICE INDEX FOR MANUFACTURING GOODS AND THE TERMS OF TRADE FACING UGANDA

Year	Agricultural Export Price Index ^a	World Export Price Index for Manufacturing Goods ^b	Terms of Trade PI ÷ XI
1950	84	86	102
1951	133	102	77
1952	127	104	82
1953	96	100	104
1954	100	98	98
1955	101	99	98
1956	92	103	112
1957	98	106	108
1958	92	106	115
1959	79	106	134
1960	71	109	154
1961	70	109	156
1962	72	109	151
1963	75	110	147
1964	97	111	114
1965	83	113	136
1966	84	117	139
1967	86	118	126
1968	91	117	129

^a Agricultural export price index is a Paasche index with 1954 as base (transferred from 1960-62 base)

^b Paasche index with 1953 as base.

Source: Kyesimira, *loc. cit.*, p. 45.
United Nations Statistical Yearbooks. Table 153.

mean that the terms of trade for Uganda are not as bad as shown in the statistics.

In the absence of any statistical information regarding the improvement of products over time, one can assume that half of the increase in import prices are as a result of improvement in quality of the products. The terms of trade for Uganda, given this assumption, have deteriorated by about 20 per cent in the last 15 years. This is a deterioration of about 1.1 per cent per annum.

Even if the above rate of deterioration of the terms of trade continues, the rate may not be significant enough to advocate any policy against expanding agricultural exports. The significance of this trend can only be determined by the opportunity cost of pursuing an alternative strategy for economic development. If there is no excessive opportunity cost involved, then the terms of trade argument cannot be used as a criterion for making investment decisions in Uganda. The issue of the opportunity cost of an alternative strategy will be discussed in the next chapter.

The factorial terms of trade should also be examined, before any decision against agricultural export development can be made. Even if prices of export commodities are falling, the country's real income would still rise if the country can improve productivity in the export sector at a faster rate than the rate of deterioration of export prices.

CHAPTER VI

AGRICULTURAL EXPORT PROMOTION VERSUS INDUSTRIALIZATION

In Chapter II and III, the role of agricultural exports as a means to develop the underdeveloped countries has been examined. However, there is also another important strategy of economic development, that is development through industrialization. This latter strategy has been advocated by leading economists, like Prebisch, who are opposed to the reliance of underdeveloped countries on agricultural exports. In Chapter IV and Chapter V the two main arguments used by these economists have been examined and it was found that the two arguments are of only limited validity as far as Uganda was concerned. Although the arguments are of limited validity it is still necessary to examine the alternative that they propose (i.e. industrialization) before a firm case can be made in favour of relying on agricultural export promotion for economic development.

This chapter will therefore compare the two main strategies of economic development. The first part of this chapter will examine the importance of savings in economic development. The role of savings is examined since it will be the key variable used in the model to evaluate the two strategies. In the second part of this chapter, a model will be developed and used to evaluate the two main strategies for economic development. Part three of this chapter will examine the other criteria for evaluating the two strategies.

6.1 Savings and Economic Development

In virtually all theories of growth, capital formation plays some part. The importance attached to capital however varies with the economists concerned. Some economists attribute a strategic role to capital while others tend to de-emphasize the importance of capital formation in economic development. One of the strong propounders of the role of capital is Professor Lewis. He contends that:

"The central problem in the theory of economic development is to understand the process by which a community which was previously saving and investing 4 or 5 per cent of its national income or less, converts itself into an economy where voluntary saving is running at about 12 to 15 per cent of national income or more. This is the central problem because the central fact of economic development is rapid capital accumulation (including knowledge and skills with capital)." ¹

The views of Professor Lewis are supported by W. W. Rostow² who maintains that one of the conditions for take-off is that the rate of productive investment should increase from 5 per cent or less to over 10 per cent of national income.

Various United Nations reports have also emphasized the importance of capital. In one of them it stated that:

¹ W. Arthur Lewis, "Economic Development with Unlimited Supplies of Labour," Manschester School of Economics and Social Studies, Vol. 22, No. 2 (May, 1954), p. 139.

² Rostow, loc. cit., p. 8.

"The general rate of development is always limited by shortage of productive factors. If any one scarce factor associated with underdevelopment should be singled out it would be capital."³

The importance of capital can also be seen with the help of the capital output ratio. If, for example, a country has a population growth rate of 2.5 per cent per annum and a capital-output ratio of 3, she will have to invest 7.5 per cent of her national income just to maintain the standard of living of her people. From this one can foresee the extent of capital accumulation necessary if the country wants to improve the standard of living of her people.

Besides capital accumulation, there are other factors which may influence the rate of economic development. One factor which may influence output without any change in the amount of capital inputs used is "X-efficiency." This term has been coined by H. Leibenstein to represent "nonallocative efficiency," the chief element of which is motivation. Leibenstein maintains that improvement in this factor will have a great deal of impact on the process of economic growth.⁴

The basis of this contention of Leibenstein is that firms and economies do not operate on the outer-bound of the production possibility curve. This is because people and organizations do not normally work as hard or as effectively as they

³ United Nations, ECAFE, "Programming Techniques for Economic Development, Report of the First Group of Experts on Programming Techniques, Bangkok, 1960, p. 8, cited in G.M. Meier, Leading Issues in Economic Development (Oxford University Press, 1970), p. 169.

⁴ Harvey Leibenstein, "Allocative Efficiency vs 'X-Efficiency' ", American Economic Review, Vol. 56, pt. 1 (1966), p. 392-415

could⁵ They tend to satisfy rather than maximize. This is mainly because of lack of achievement motivation. The inadequate nature of institutional structure may also hinder the maximization process. As a result there would be suboptimal disequilibrium in regard to the utilization of existing capital stock and technology.

Another factor of significant importance in the process of economic development is the quality of human resources. Through education, training and experience, the quality of the labor force can be improved which would lead to an increase in their productivity. However such improvements would also require investment. Therefore like physical capital, human capital would require savings.

This study from now onwards will concentrate only on capital. This would include both physical and human capital. The "X-efficiency" factor is being dropped because it is not a variable in the selection of an optimum strategy of development. It does not enter the selection procedure because the author is not aware of any empirical study which shows that there is a possibility of achieving greater "X-efficiency" in one strategy rather than in the other.

There are three steps in the process of capital accumulation.

- (1) An increase in the volume of real savings,
- (2) The channeling of savings through a finance and credit mechanism,
- (3) The act of investment itself.

From the above steps of the process of capital accumulation one can see that the availability of real savings, although an essential part of investment, is

⁵ Ibid.

not the only requirement. Savings have to be put into productive investment. This requires an efficient financial mechanism and an investment minded population. One can bring this about through institutional and social development. However any stress on the last two requirements should not overshadow the primary requirement of real savings.

There are three main sources of savings:

1. Private domestic savings
2. Domestic government savings
3. Foreign savings

In addition the country can achieve savings through generating of inflation.

Private domestic savings in underdeveloped countries are lower on the whole. This is because of the low levels of income and the high marginal propensity to consume. Although there is usually a well-to-do minority who do significant amounts of saving, these savings are usually inadequate in relation to the country's requirements.

Since voluntary domestic savings are generally low, the government is usually forced to resort to savings through taxation. One of the ways of raising tax revenue is to impose export duties on the agricultural exports. Imports are also usually taxed heavily. Both these methods of raising tax revenue are simple to implement even in countries which do not have an elaborate institutional structure.

The third source of savings is foreign loans, grants and investments. At

present, the contribution from this source is important, but rather limited. Most countries, including Uganda, have failed to attract enough foreign investment or to receive sufficient foreign aid. Table 1 shows the amount of long term capital which Uganda has received during the period 1961 - 1968. These figures do not include military aid.

TABLE 1
LONG TERM CAPITAL RECEIVED BY UGANDA

Year	Centrally Planned Economy	Developed Market Economy	£' M Total
1961	-	3.45	3.45
1962	-	4.20	4.20
1963	-	2.66	2.66
1964	2.10	2.65	4.76
1965	4.20	3.08	7.28
1966	-	3.45	3.45
1967	-	2.94	2.94
1968	-	2.80	2.80

Source: UN Statistical Year Books.

If Uganda wants to have a growth rate of 5 per cent in her per capita income, she needs to invest £ 67.5⁶ million annually. The amount of long term

⁶ Taking a capital-output ratio of 3, population growth rate at 2.5 per cent per annum, and a GNP of £ 300 million.

external capital investment she receives is therefore less than 10 per cent of her total requirements. Moreover instead of foreign capital increasing over time, it has declined slightly during the period.

Foreign assistance, if not in the form of grants, would also mean some burden in the future. The extent to which the foreign loans can be serviced and repaid will ultimately depend on what can be saved at home in the future. Therefore the only real alternative that the underdeveloped countries have is to rely on domestic savings to break out of the vicious circle of poverty.

The crucial importance of domestic savings should therefore necessitate the use of saving - capital ratio as one of the main criteria for evaluating policy regarding investment decisions. Projects having a higher saving - capital ratio and thereby allowing a higher rate of re-investment should be preferred to projects having a lower saving-capital ratio, assuming other things being equal. The criterion of choosing projects based on their marginal re-investment quotient has been advocated by W. Galenson and H. Leinbenstein.⁷ They state that the appropriate goal of development should be the maximization of income at some time in the future and so the correct criterion for investment should be one which maximizes the rate of savings and therefore the rate of investment.

⁷ W. Galenson and H. Leibenstein, "Investment Criteria, Productivity, and Economic Development," Quarterly Journal of Economics, Vol. LXIX (August, 1955), p. 343-370.

6.2 (a) The Model

The model being developed here is an investment decision model. This model will be used to evaluate investment decisions in agricultural export development and import substitution industries. The key variable used is the savings – capital ratio. This is the criterion used for evaluating the investment decision. The model makes the following theoretical assumptions:

1. That output is increased as a result of an exogenous investment.
2. The investment is in the form of capital goods imported from abroad. As a result there would be no multiplier effect of this investment. This assumption is valid for Uganda since the country has to import most of her capital goods. The limited quantity of investment using local products will also not affect the model of the ratio of investment in local goods to total investment is equal for both the strategies.
3. A linear capital-output function.
4. Limitations, if any, on the ability to invest are the same in both the strategies.
5. There is no time lag between derived demand for a product and output of that sector. It is assumed that businessmen would have anticipated the demand and would have made the necessary investment.
6. Seventy-five per cent of the tax revenue generated would be considered as part of savings. This is because the government can use this proportion of the extra tax revenue generated, for investment purposes. The rest, i.e. 25 per

cent would be used to provide services primarily for consumption.

Let us assume that output in each sector (i.e. agricultural export sector and import substitution industries) is increased by an equal amount in Year 1 as a result of an exogenous investment. This will provide income for people in each of the two sectors. Part of this income is saved either through private savings or government taxation and the rest is used to buy local and imported commodities. The demand for imported goods will generate savings through import duties. The demand for local commodities will lead to an increase in output and thereby provide income to people in the various sectors. Part of this additional income will be saved and the rest used to buy consumer goods. This cycle of income, consumption and saving, and income will continue as long as the total leakage (saving and imported goods) doesn't exceed the initial output. In Year 2 a second series of chain reactions will start as a result of output from the initial investment. This model will however restrict itself to the chain reaction started as a result of output in Year 1.

From the above chain reaction one can compute the saving output ratio and the capital output ratio for each of the two strategies of development.

Assuming other things being equal, agricultural export development would be advocated if:

$$\frac{1}{V_{ags}} \cdot S_{ags} > \frac{1}{V_{ims}} \cdot S_{ims}$$

where

V_{ags} = incremental capital-output ratio when applying agricultural

export strategy .

$$V_{ags} = \frac{K_{ag} + \sum_{j=1}^k \sum_{i=1}^n K_{ij}}{O_{ag} + \sum_{j=1}^k \sum_{i=1}^n O_{ij}}$$

K_{ag} = initial investment in agricultural export sector

O_{ag} = first year output as a result of K_{ag} investment

K_{ij} = investment requirements in the i^{th} sector at period j as a result of derived demand .

O_{ij} = output of the i^{th} sector at period j as a result of K_{ij} investment .

S_{ags} = marginal saving - output ratio when applying agricultural export

development strategy;

$$S_{ags} = \frac{S_{ags} + \sum_{j=1}^k \sum_{i=1}^n S_{ij}}{O_{ag} + \sum_{j=1}^k \sum_{i=1}^n O_{ij}}$$

S_{ag} = net savings from the O_{ag} output

O_{ag} = first year output as a result of K_{ag} investment

S_{ij} = saving in the i^{th} sector at period j as a result of O_{ij} output .

O_{ij} = output of the i^{th} sector at period j .

V_{ims} = incremental capital output ratio when applying import substitution strategy .

$$V_{ims} = \frac{K_{ims} + \sum_{j=1}^k \sum_{i=1}^n K_{ij}}{O_{ims} + \sum_{j=1}^k \sum_{i=1}^n O_{ij}}$$

S_{ims} = marginal saving-output ratio when applying import substitution strategy .

$$S_{ims} = \frac{S_{ims} + \sum_{j=1}^k \sum_{i=1}^n S_{ij}}{O_{ims} + \sum_{j=1}^k \sum_{i=1}^n O_{ij}}$$

6.2 (b) Implementation of the Model

As previously mentioned the time that may be allotted to the development of a thesis, and the inadequate nature of data that are available, does not allow this study to make full use of the investment decision model presented here. As a result the following restricted model will be used.

Agricultural export development will be advocated if:

$$\frac{1}{V_{ags}} \cdot S_{ags} > \frac{1}{V_{ims}} \cdot S_{ims}$$

where

$$V_{ags} = \frac{K_{ag}}{O_{ag}} ; \quad S_{ags} = \frac{S_{ag}}{O_{ag}}$$

$$V_{ims} = \frac{K_{ims} + K_{ia}}{O_{ims}} ; \quad S_{ims} = \frac{S_{ims}}{O_{ims}}$$

K_{ims} = initial investment in import substitution sector

K_{ia} = investment required in agricultural sector to supply primary and intermediate goods to the import substitution sector.

O_{ims} = first year gross output of the import substitution sector as a result of the initial investment.

In the implementation of this model, the author will use statistical information on distribution of incomes to various factors of production; distribution of income among income groups; consumption and saving patterns; tax structure, and other related information to determine the saving-output ratio for the two strategies. This will then be combined with information on capital-output ratios to determine the optimum strategy for economic development.

In the implementation of this model, agricultural export promotion is restricted to cotton and coffee. This is because data for the other crops are inadequate. This restriction in the definition of agricultural exports does not invalidate any generalization made later when applying it to all the agricultural exports of Uganda. Cotton and coffee form more than 80 per cent of agricultural exports and therefore they can be taken as a good representation for all the agricultural exports.

Table 2 shows the capital output ratios for various sectors in Uganda. The capital output ratio for agricultural-livestock production is given as 1.1 in Uganda's second Five Year Development Plan.⁸ However, the Plan did not consider the

⁸ Work for Progress, Uganda Second Five Year Development Plan, 1966-1971.

TABLE 2
SECTORAL INVESTMENT TARGETS
UGANDA (1966-1971)

Sector	Investment £ m	Added Output £ m	Capital Output Ratio
Agriculture - Livestock	25.9	22.9	1.1
(Agriculture - Livestock) ^a	(54.9)	(22.9)	(2.4)
Forestry-Fishing-Hunting	1.0	1.1	0.9
(Forestry-Fishing-Hunting) ^a	(1.8)	(1.1)	(1.6)
Mining-Quarrying	3.0	2.1	1.4
Manufacturing	40.1	12.8	3.1
Electricity	23.0	2.2	10.4
Construction	8.0	3.9	2.1
Commerce	14.0	15.6	0.9
Transport/Communication	40.0	3.4	11.8
Government/Misc. Services	50.0	15.7	3.2
Rent	25.0	2.4	10.4

^a Adjusted for direct labor investment (perennial crops, land improvements), natural increase (livestock, perennial crops) and small farmers cash investment (labor, working capital, hand implements).

Source: Calculated and estimated from Uganda Work for Progress, 1966-1971 by R. H. Green, loc. cit., p. 31.

requirement of investment by the African farmers to supplement government and corporation investments. R. H. Green⁹ estimates that the actual capital-output ratio for the agriculture-livestock sector is 2.4. The capital output ratio for the manufacturing sector is 3.1¹⁰.

6.2(c) Import Substitution Sector

The value added by a manufacturing firm forms 35 per cent of the final output of that firm.¹¹ The remaining 65 per cent is the value of primary and intermediate goods used by the firm. B. van Arkadie mentions that import substitution would require about 35 per cent of the gross output value to be spent on imported materials.¹² The remaining 30 per cent will therefore be inputs from the other domestic firms. In the absence of any statistical information on the break down of this 30 per cent, it will be assumed that 15 per cent of it comes from the agricultural sector while the other 15 per cent comes from value added by other firms in the manufacturing sector.

⁹ R.H. Green, "Cautious Growth Promotion and Cautious Structuralism: the Kenya and Uganda 1966 Development Plans," East African Economic Review, Vol. II, No. 2(December, 1966), p. 31.

¹⁰ Capital-output can be flexible to a certain extent depending upon the type of technology which is being used. The author, by making use of the capital output ratios of the Second Five Year Development Plan makes an implicit assumption that the optimum type of technology is being advocated in the plan.

¹¹ Stoutjesdijk, loc. cit., Table 7, p. 33.

¹² B. van Arkadie, "Import substitution and Export Promotion as Aids to Industrialization in East Africa," Readings in the Applied Economics of Africa Vol. 2, Macro-Economics, ed. E.H. Whetham and J.I. Currie (London: Cambridge University Press, 1967), p. 159.

The development of value added and its components for the total manufacturing sector in Uganda, is shown in Table 3. From the table it can be seen that approximately 40 per cent of the value added goes to the wage bill while 60 per cent goes to profits, interests, and depreciation. This proportion will therefore be used to represent the break down of the value added for import substitution industries and agricultural processing industry.

TABLE 3

THE DEVELOPMENT OF VALUE ADDED AND ITS COMPONENTS. TOTAL
MANUFACTURING SECTOR 1957-64
(Current Prices)

Year	(1) Value Added £ m	(2) Total Wage Bill £ m	2/1 Percent	Profits, interests and Depreciation £ m	3/1 Percent
1957	11.1	3.7	33.3	7.4	66.7
1958	10.3	3.8	36.8	6.5	63.2
1959	10.1	4.0	39.6	6.1	60.4
1960	9.9	4.3	43.4	5.6	56.6
1961	10.4	4.8	46.1	5.6	53.9
1962	9.8	4.7	47.9	5.1	52.1
1963	16.8	5.3	31.5	11.5	68.5
1964	17.1	5.9	34.5	11.2	65.5
		Average:	39.14	Average:	60.86

Source: E. J. Stoutjesdijk, *Uganda's Manufacturing Sector* (Nairobi: East African Publishing House, 1967), p. 27.

The components of gross profit for all companies in Uganda have been computed and estimated by Newlyn.¹³ The results obtained are shown in Table 4. This distribution will be used in our model.

TABLE 4
COMPONENTS OF GROSS PROFIT FOR ALL COMPANIES IN UGANDA
1964

	£'M	Percent
Undistributed net profit	2.4	19.5
Dividends paid	3.6	29.3
Corporate Income Tax	3.2	26.0
Depreciation	3.1	25.2
Gross Profit	12.3	100.0

Source: Calculated and estimated by W.T. Newlyn, loc. cit., p. 39.

In Uganda there is wide divergence in the amount of wages and salaries that a person receives. It has therefore been decided to create four income groups to which the wages and salaries generated by the output will be allocated. The distribution of income for the four groups for Kampala area is shown in Table 5.

¹³ W. T. Newlyn, Finance for Development (Nairobi: East African Publishing House, 1968), p. 39.

TABLE 5
DISTRIBUTION OF WAGES AND SALARIES:
1966

Group	Wage or Salary Group (Shillings per year)	Mean Wage (Shillings per year)	Percent of Total Labor Force
I	18,000 ⁺	28,332	1.8
II	7,200-17,999	13,200	3.6
III	3,600- 7,199	5,207	27.4
IV	Under 3,599	2,237	38.4

Source: Calculated and estimated from Table 9, Urban Enumerated Employees by Wage Group, 1966 in M. Tribe. "Pattern of Urban Housing Demand in Uganda," East African Economic Review, Vol. IV, No. 1 (June, 1968), p. 47.

From Table 5 the share of wages and salaries going to each income group can be determined. The distribution is shown in Table 6.

TABLE 6
DISTRIBUTION OF TOTAL WAGES AND SALARIES BY INCOME
GROUPS

GROUP	PERCENT
I	13.0
II	12.1
III	36.5
IV	38.4

Chart 1 shows the breakdown of value added by the manufacturing sector into the various personal and corporate components using the information of Table 3 to Table 6. It is being assumed that the first year output at factor cost is shillings, one hundred thousand.

The dividends paid out by companies will from now on be assumed to go to Group I. This is because only the high income group in Uganda makes any investment in the stock market.

This study will now try to breakdown the gross income into two components, i.e. personal taxes and disposable income. The disposable income will then be further divided into the saving and the consumption elements.

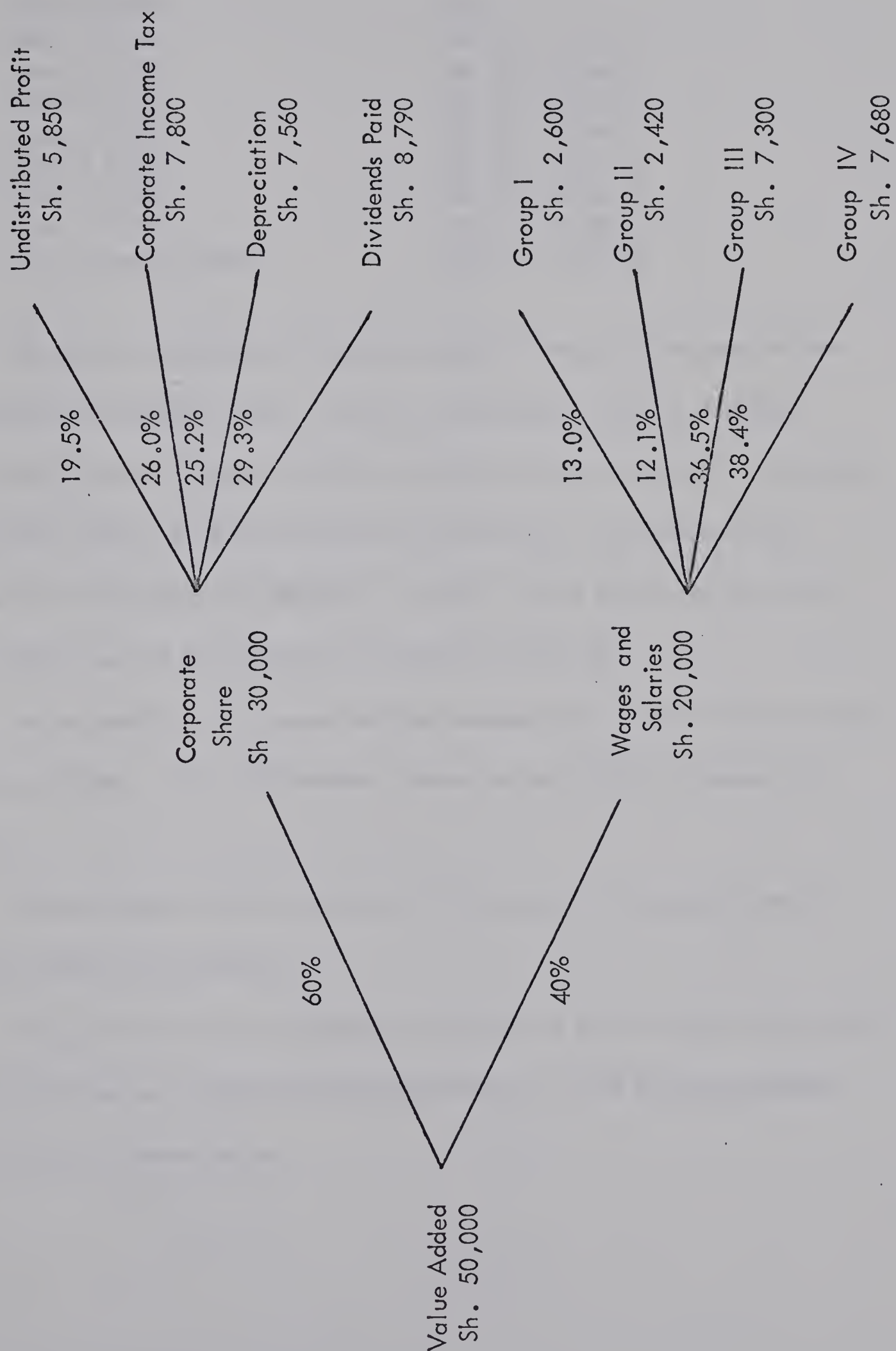
In Uganda there are three kinds of personal taxes. These are income tax, development tax and graduated tax. In addition there is a social security contribution of 5 per cent with a maximum of Shs. 480 per annum. The social security contribution will be regarded as part of taxes. This is because the scheme has been implemented only recently and therefore the payments for old age will be negligible in the first few years.

Uganda has an income tax at the rate of Shs. 2/50 in the £ on the chargeable income. Besides that there is a surtax at the following rate.¹⁴

¹⁴ D. P. Ghai, loc. cit., p. 77.

CHART 1

COMPONENTS OF THE VALUE - ADDED BY THE MANUFACTURING SECTOR



<u>Chargeable Income</u>	<u>Rate</u>
First £ 1,000	Nil
Next £ 1,000	Shs 3/- in the £
Next £ 1,000	Shs 5/- in the £
Next £ 1,000	Shs 7/- in the £
Next £ 1,000	Shs 8/- in the £
Next £ 1,000	Shs 9/- in the £
Next £ 1,000	Shs 10/- in the £
Next £ 3,000	Shs 11/- in the £
Excess over £ 10,000	Shs 12/- in the £

The taxpayer is allowed to deduct certain allowances from gross income to determine the chargeable income. There is a marriage allowance of £600 per annum and a child allowance of £96 each for the first four children. The child allowance then drops to £48 for the fifth and sixth child. The maximum total allowance will therefore be £1,080 (Shs. 21,600). Such a high allowance allows more than 95 per cent of the population to escape from this tax.

In our model we will assume that the average salary earner will be married and have two children. This will therefore reduce income subject to income tax by £792.

The development tax is a flat rate of 2 per cent on the gross income if the person is subject to income tax.

The graduated tax, as it operates in Uganda, is a form of poll tax but with a degree of progression. The tax revenue generated goes to the local governments.

The rate structure is shown below:

TABLE 7
SCHEDULE OF UGANDA TAX RATES

Income (Shillings per year)	Tax (Shillings Per Year)
Over 12,000	600
10,800 - 12,000	550
8,400 - 10,800	440
6,000 - 8,400	330
4,800 - 6,000	275
3,600 - 4,800	220
2,400 - 3,600	165
1,800 - 2,400	110
less than 1,800	66

Table 8 shows total taxes as a percentage of income for the four income groups.

TABLE 8
PERCENTAGE OF INCOME PAID AS TAXES BY DIFFERENT
INCOME GROUPS

Group I		
Mean Income per year		Shs. 28,332
Income Tax	1562.62	
Development Tax	566.64	
Graduated Tax	600.00	
Social Security Contribution	480.00	
Total	3209.26	
Taxes as percentage of Income		11.33

Table 8 (Continued)

Group II

Mean Income per year		Shs. 13,200
Income Tax	---	
Development Tax	---	
Graduated Tax	550	
Social Security	480	
Total	<u>1030</u>	
Taxes as percentage of Income		7.80

Group III

Mean Income per year		Shs. 5,207
Graduated Tax	275.00	
Social Security	<u>260.35</u>	
Total taxes	535.35	
Taxes as percentage of Income		10.28

Group IV

Mean Income per year		Shs. 2,237
Graduated Tax	110.00	
Social Security	<u>111.85</u>	
Total	221.85	
Taxes as percentage of Income		9.92

To determine the amount of savings generated from the disposable income ,

a study done by C.W. Howe¹⁵ is being used. He used the following regression equation to determine total expenditure:

$$\text{Total Expenditure} = a + b \text{ Disposable Income}$$

For Kampala area the results obtained are shown below:

$$\text{Total Expenditure} = -1.980 + 0.905 \text{ Income} ; R^2 = 0.856 \\ (0.163)$$

Since he was dealing only with the lower income group in the Kampala area study, his results will be used only for Group III and Group IV. For Group I and Group II the results of a study for Nairobi area are being used. The Nairobi study included people also from middle income groups. The results for Nairobi area are as following:

$$\text{Total Expenditure} = 30.44 + 0.728 \text{ Income}^* \quad R^2 = 0.973 \\ (0.0404)$$

where $\text{Income}^* = \text{cash receipts} \div \text{household size} (2.95)$

When these two regression equations were used the following saving - income ratios were arrived at:

Percentage saved from Disposable Income

Group I	26.9
Group II	26.5
Group III	9.03
Group IV	8.94

¹⁵ C. W. Howe, "African Household Consumption and Financial Behavior," East African Economic Review Vol. IV, No. 1 (June, 1968), p. 51 - 61.

The above results appear plausible and therefore they will be used to determine the amount of private savings generated.

Chart 2 shows the amount of personal taxes and savings generated out of the value added component of the gross output of the manufacturing sector.

From Chart 1 and Chart 2 we can compute the private savings and the taxes collected out of the value added by the manufacturing sector. The total private savings are Shs. 10,363 while total taxes collected are Shs. 10,791. These figures will be used in latter computations.

6.2 (d) Agricultural Export Development Strategy

The break down of export proceeds for the period 1964-1968 is shown in Table 9. The farmers receive 59.9 per cent of the export proceeds. The government takes 10.8 per cent in the form of export duties and net marketing board surplus. The rest, 29.3 per cent, is taken by coffee processing, cotton ginning, transport etc. The government share in the last five years have been lower because of deficits in the marketing board funds. It is expected that the government will not allow such deficits to recur and so the government share would be higher in the future. However for our analysis we will take the above figures.¹⁶

¹⁶ The author feels that the relatively heavy burden on Uganda farmers can continue in the future.

PERSONAL TAXES AND SAVINGS GENERATED FROM INCOME ACCRUING TO PRIVATE HOUSEHOLD

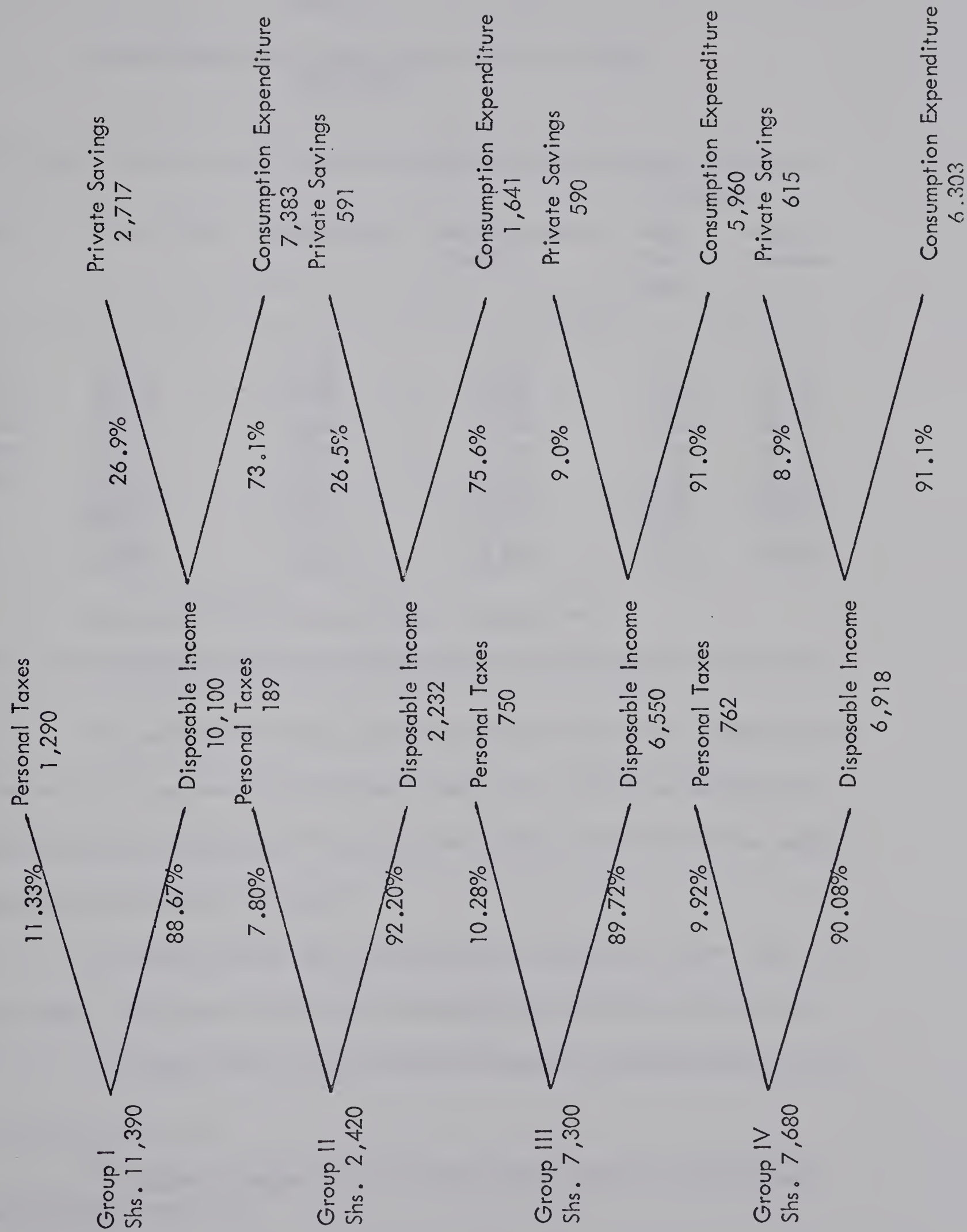


TABLE 9

COMPONENTS OF COFFEE AND COTTON EXPORT PROCEEDS

Year	Export Value	Export Duty	Marketing Board Surplus	£ Million	
				Total Gov't Share	African Growers
1964	51.24	8.72	-2.20	6.52	29.18
1965	47.18	6.97	0.26	7.23	34.50
1966	50.13	4.67	-1.34	3.33	36.91
1967	49.75	8.38	-2.31	6.07	25.77
1968	50.55	7.71	-3.90	3.81	23.75
	<u>248.85</u>	<u>36.45</u>	<u>9.49</u>	<u>26.96</u>	<u>149.11</u>
	100%	14.6%	-3.8%	10.8%	59.9%

Balance of 29.3% for processing, transport, etc.

The proportion of export proceeds going to the processors, primary buyers, transport etc. is assumed to have the same components as the value added of the import substitution industries. This assumption is based on the fact that the capital-output ratios of both are the same.¹⁷

It is being assumed that the average cash receipts of a farmer is Sh. 100 per month. This figure will be used to determine his tax liability and his savings.

An income of Shs. 100 per month will lead to a tax assessment of Shs. 66

¹⁷ Capital - output ratio for cotton ginning, coffee curing and sugar manufacturing is also 3.1.

a year for Graduated Tax. This is 4.9 per cent of the farmer's cash receipt. The farmer will not be subject to the other taxes.

To determine the saving-income ratio of the farmers, a study done by C.W. Howe on semi-urban households in Mbale, Fort Portal and Gulu is being used.¹⁸ The study had given the following results:

$$\text{Total Cash Expenditure} = -56.704 + \frac{56.043}{(3.650)} \log Y + \frac{3.844}{(2.114)} \log S$$

$$R^2 = 0.971$$

$$Y = \text{Cash receipts} \div \text{household size (2.8)}$$

$$S = \text{Value of subsistence output}$$

Since the value of the third parameter is not significantly different from zero and since information on subsistence output is not available, the following regression equation will be used:

$$\text{Total Cash Expenditure} = -56.704 + 56.043 \log Y$$

where:

$$Y = 35.7 \text{ sh.}$$

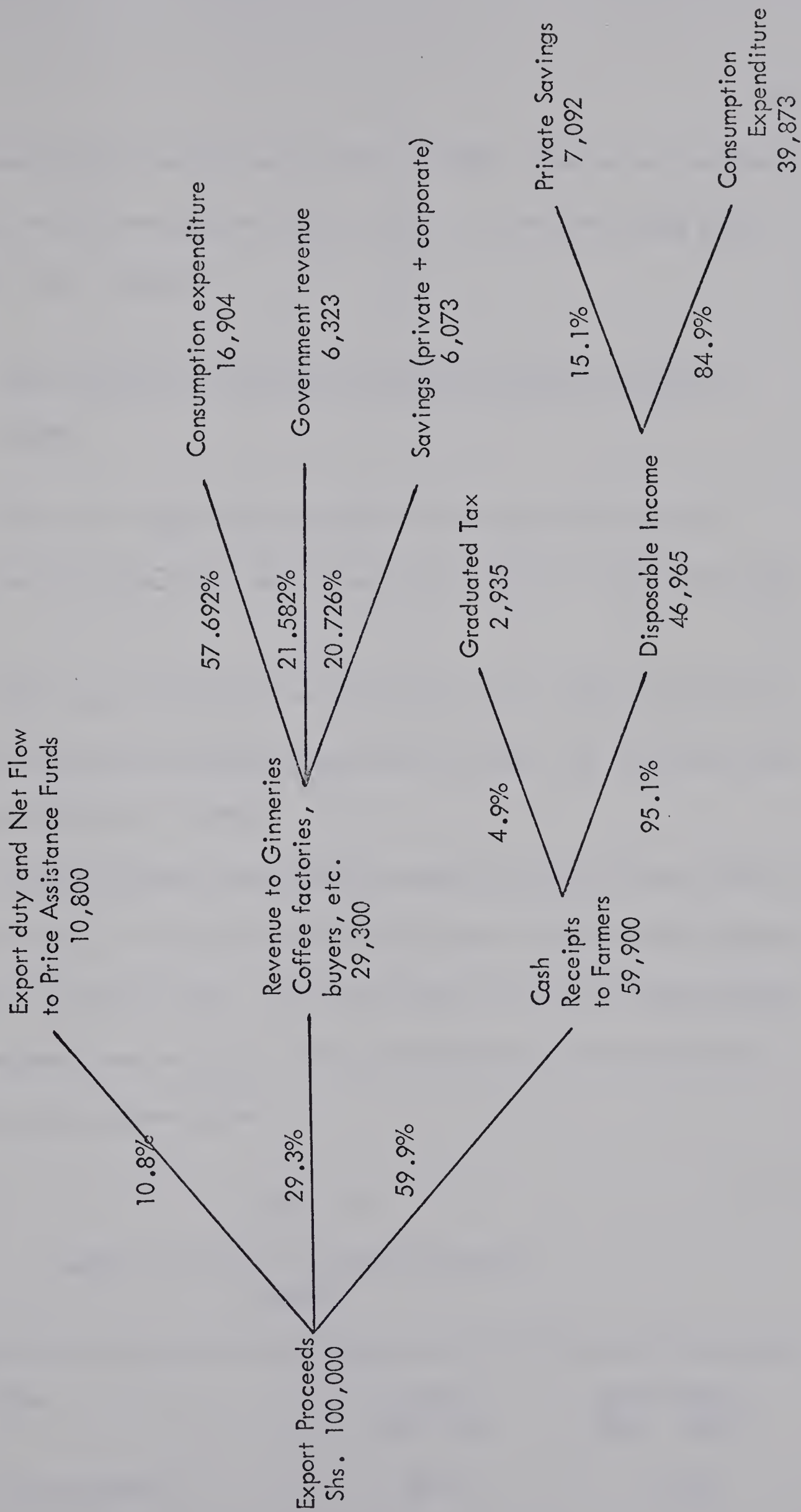
The above equation gave a saving - disposable income ratio of 15.1 per cent. This is higher than that of urban workers because of the availability of home grown food.

Chart 3 shows the breakdown of the agricultural export proceeds into various components. The amount of private savings is Shs. 13,165. The output

¹⁸ Howe, loc. cit.

CHART 3

COMPONENTS OF THE AGRICULTURAL EXPORT PROCEEDS (COFFEE AND COTTON)



has also generated government revenue of Shs. 20,058. Since we are considering only 75 per cent of government revenue as savings, the total net savings (public and private) is Shs. 28,208.

6.2 (e) Import Substitution Strategy and Agricultural Export Development Strategy

We can now apply the savings pattern of the agricultural sector to determine the components of the value of agricultural inputs of the manufacturing industry.

Chart 4 gives the break down of the gross output of the manufacturing sector. The total private savings generated is Shs. 12,338. The total government revenue generated is Shs. 13,799.

The above figures do not take into account the effect of import duties on government revenue. The government would lose import duties since the commodity is now being produced locally. On the other hand, it will gain revenue through duties on imported "raw materials." The rate of taxation on raw materials and intermediate goods is shown below.

TABLE 10
IMPORT DUTY ON SELECTED MATERIALS
1966/67

Item	Imports (Sh. m.)	Import Duties (Shs. '000)
Crude material	20.41	247

CHART 4

COMPONENTS OF THE GROSS OUTPUT OF THE IMPORT SUBSTITUTION SECTOR

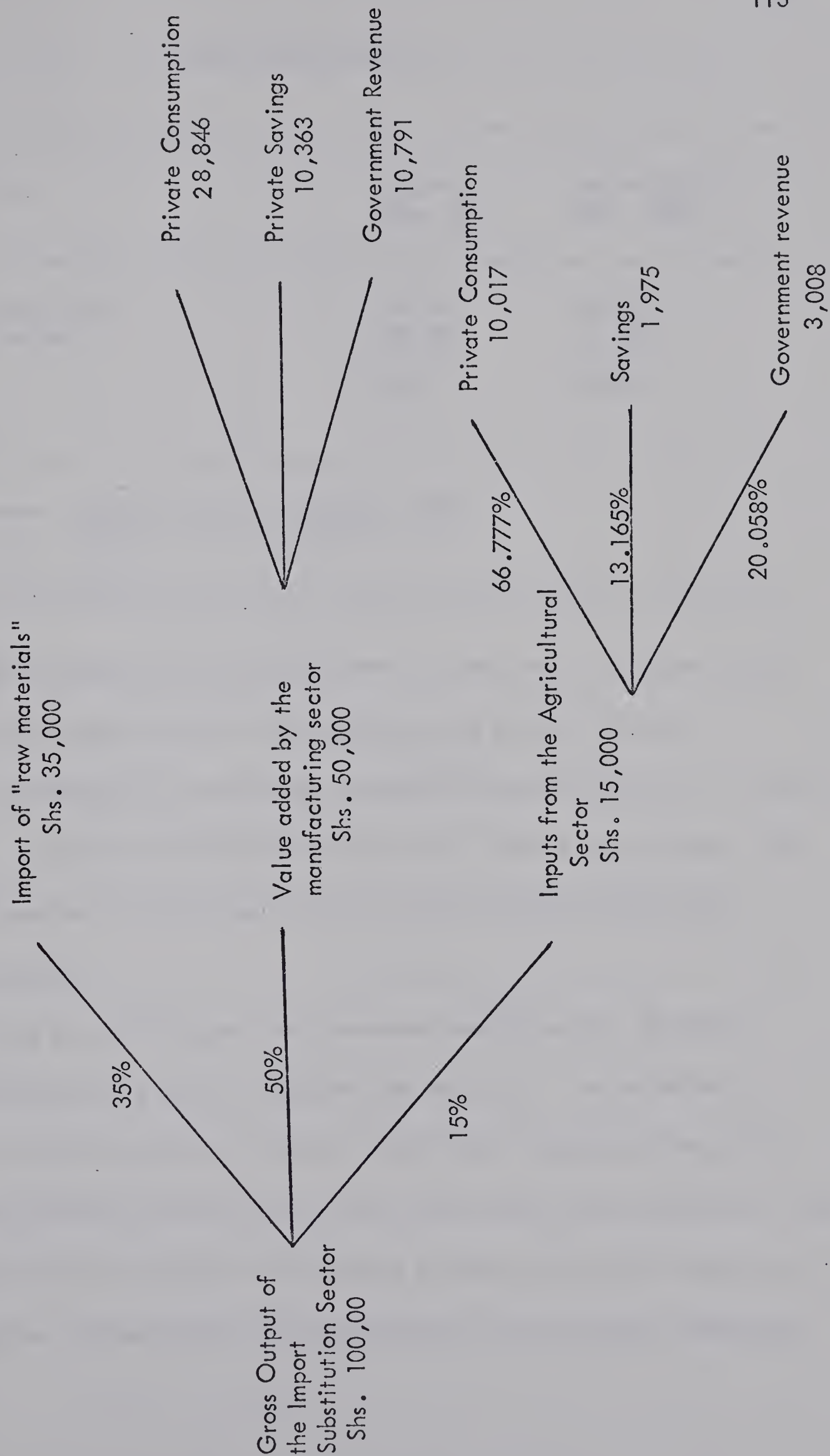


Table 10 (Continued)

Item	Imports (Shs. M)	Import Duties (Shs. '000)
Mineral fuels	56.18	76,940
Chemicals	103.58	5,504
	180.17	82,687

Source: Uganda Statistical Abstract, 1969.

The duty on c.i.f. value is therefore 45.5 per cent. The import duty on most manufactured goods is in the region of 35 per cent on c.i.f. values.

It is necessary for our analysis to convert the above duties on c.i.f. value into duty as a percentage of the final cost (i.e. c.i.f. value + import duties). The computed figures for this percentage is 31.2 for "raw materials" and 25.9 for manufactured goods.

Using the above figures, the government would lose Shs. 25,900 on manufactured goods and gain Shs. 4,680 on "raw materials." The net effect is a loss of Shs. 21,220 in government revenue. If we deduct this amount from government revenue generated from other taxes, the net government loss would be Shs. 7,421. Since the government would have to continue to provide services which they were providing before, this amount has to be deducted from private savings to determine

the net total savings. The net total savings as a result of gross output of Shs. 100,800 in the manufacturing sector is Shs. 4,917.

All the information necessary for the investment decision model have been computed. These values can now be plugged into the model.

Agricultural export development strategy should be advocated if:

$$\frac{1}{V_{ags}} \times S_{ags} > \frac{1}{V_{ims}} \times S_{ims}$$

where:

$$S_{ags} = \frac{28,208}{100,000} = 0.28208$$

$$S_{ims} = \frac{4,917}{100,000} = 0.04917$$

$$V_{ags} = \frac{K_a + K_p}{O_{ag}} = \frac{2.4(70,700) + 3.1(29,300)}{100,000} = 2.6$$

K_a = initial capital investment in agriculture

K_p = initial capital investment in agricultural processing industries

$$V_{ims} = \frac{K_{im} + K_a}{O_{ims}} = \frac{3.1(50,000) + 2.4(15,000)}{100,000} = 1.91$$

K_{im} = initial capital investment in import substitution industry.

K_a = investment in agriculture sector to provide inputs for the import substitution industry.

Substituting these values we get:

$$\frac{1}{2.6} \times 0.28208 > \frac{1}{1.91} \times 0.04917$$

$$0.1085 > 0.02565$$

Since the above inequality holds, agricultural export development should be the main development strategy for Uganda. Saving-investment ratio for agricultural export strategy is 10.85 per cent compared to a low of 2.565 per cent for import substitution industries.

There has been an implicit assumption throughout the previous analysis that the conditions that are prevailing at the moment will continue. It is therefore necessary to look into this basic assumption. One should look into the future conditions that may prevail. The variables in the model should also be examined to see if they can be influenced by the government.

The future prospects for agricultural products appears to be reasonably good. The future prospects will be examined in Chapter VII. However one thing that the decision-maker has to keep in mind when choosing the development strategy is that the terms of trade will continue to move against agriculture by about one per cent. Therefore allowances for this have to be made.

The government can, to a certain extent, influence the saving-output ratio. For instance, the government can increase the tax rate for those in the urban sector. This action may be taken in an attempt to move the decision model in favour of import substitution industries. However this attempt may be futile. Any attempt to increase the tax burden on the labour force would force trade unions to demand higher wages. These demands, if accepted, would lead to higher prices and thereby reduce the real value of the tax revenue generated.

The increase in the taxes for those in the upper income group would

lead to a limited curtailing of consumption since part of the saving would be used to maintain the previous level of consumption. The amount generated would also not be enough to shift the balance in favour of import substitution industries. There may also be the problem of the disincentive effect of this taxation. One should also realize that the government is the largest employer of people in the high income group. Any attempt to increase the level of taxes on them would be met by an internal powerful pressure group.

The need for protection of the import substitution industries to survive is also an implied assumption of the previous analysis. The validity of this assumption can be seen clearly from the example given below.

"The two mills in Jinja (Uganda) produced more cloth than all other East African mills together. Labour efficiency appeared to be lower than in case of European or Japanese workers, so that despite the fact that wages were also only little over a third of Japanese workers' wages, Uganda could not expect to compete on the world market; her production costs were estimated to be about 20 to 25 per cent higher than the c.i.f. prices of fabrics imported from Japan, Hong Kong, India, or China." ^{19,20}

If a major industry like textile cannot compete, the chances of other small import substitution industries surviving without protection of the custom duties are negligible.

The production costs of the import substitution industries are higher than

¹⁹ A.W. Seidman, "Comparative Industrial Strategies in East Africa," East Africa Journal, Vol. VII, No. 6 (June, 1970), p. 29.

²⁰ The statement is being made more than a decade since the first textile mill was established. The argument of the learning function cannot therefore be presented in this case.

the production costs in other countries mainly because of the small scale of plant used. Large, more efficient plants can not be used because of the small size of domestic market.

6.3 Other Criteria for Evaluating Investment Projects

Agricultural export development has been advocated in the above analysis by using saving - capital ratio as a criterion for decision - making. However before a firm case can be made in its favour it is necessary to examine other arguments that have been presented by economists in the controversy of development through agricultural exports versus development through import substitution.

G. F. Papanek says that the basic argument for agricultural priorities is the contention that agricultural and rural production can be raised rapidly and with little capital. It is claimed that the application of fertilizer and the use of improved seeds can double or triple yield without any significant increase in costs.²¹ Another method of raising labor productivity is by teaching farmers better methods of cultivation. The following example indicates the possible magnitude of the effect of such innovations in the underdeveloped countries.

"A striking example has been reported by the plant breeder at the Kakemega experimental farm in Kenya. A synthetic hybrid corn grown on African farms with

²¹ G. F. Papanek, "Development Problems Relevant to the Agricultural Tax Policy," Papers and Proceedings of the Conference on Agricultural Taxation and Economic Development (Cambridge: Harvard Law School, 1954), p. 193.

careful supervision of seedbed preparation, fertilizer application and other operations, gave yields of 140 bushels of maize to the acre, of the order to eight times as high as typical yields in the area.²²

The World Bank Mission gave a similar example for Uganda.

"The advantages of pest control are demonstrable. Increase of 250-480 pounds per acre have been obtained under cultivation conditions by spraying cotton with a D.D.T. insecticide at specific stages in the growth of the cotton plant so as to bring the Lygus bug and the spring bollworm under control. The average current yield is of 300 - 450 pounds per acre for the cotton crop as a whole."²³

Assuming a price of 50 cents per pound for seed cotton to the growers, a fifty shilling investment would bring a return of between 125 - 240 shillings.²⁴

Even if we discount such spectacular returns, the very fact that the capital output ratio for the agriculture export sector is lower than the import substitution industries, means that a given amount of investment would lead to a higher annual output in the former sector than in the latter. Therefore on this particular ground one can advocate concentration of investment effort in the agricultural export sector.

Industrial development is also not attractive because it would require massive infusion of capital. This is because a large quantum of investment in related industries would be necessary in order to make any given industry economically

²² B.F. Johnstone, and S. Neilson, "Agricultural and Structural Transformation in Developing Economy," Economic Development and Cultural Change, Vol. XIV, No. 3 (1966), p. 292.

²³ IBRD, The Economic Development of Uganda (Baltimore: Johns Hopkins Press, 1962), p. 170.

²⁴ The author is aware of the third party cost involved in DDT usage. The example has been given only to illustrate what modern technology can do to raise agricultural productivity.

viable. The establishment of industries would also require huge investment in social infrastructure like housing, roads, social and health facilities, etc. which are made necessary due to the population movement into the urban areas. The development of agriculture, on the otherhand would not require simultaneous massive investment in related industries nor would it necessarily require such a large capital expenditure on social infrastructure.

Industrial development would also put pressure on the country's balance of payment position. This is because investment in industries may have a much higher import content than investment in agriculture. The need to import raw materials for the import substitution industries would also lead to a drain on the foreign exchange reserve. There is need to import raw materials because the manufacturing processes have remained "short and simple so that the imported materials form a particularly high percentage of the value of the final product." ²⁵

The assumption of the availability of complementary inputs in the investment decision model is also not valid especially for the import substitution industries.

Industries would require relatively more managerial and technical personnel which are very limited in underdeveloped countries. If these countries want to import skilled people, they will have to pay a high premium. The payment of high salaries would not only increase production costs but also would further drain the

²⁵ Seidman, loc. cit., p. 28.

country's reserves.

If the social justice criteria is applied, one should not advocate import substitution industries. This is because it will lead to greater inequality of income than if the investment was made in the agricultural export sector. The spending of tax revenue collected largely from the rural population on a small urban group also cannot be morally justified.

The amount of employment generated by the establishment of industries is very small compared to what the investment can generate in the agricultural sector. This is due to the capital intensive nature of industries. The fairly rigid factor proportion requirement in manufacturing also precludes any attempt to increase employment. In the period 1959 - 1968 although there has been an expansion of the manufacturing sector in Uganda, the employment figures have remained fairly steady. This has been due to shift into more capital - intensive method of production. Table 10 shows employment and output of the manufacturing sector in Uganda.

D. P. Ghai, discussing total employment in East Africa, made the following statement:

"Recorded employment in Kenya in 1965 was 10 per cent lower than in 1960, in Uganda it has marginally declined between 1960 and 1965, and in Tanzania it fell by 14 per cent over the same period. This is despite the near boom conditions throughout East Africa since 1963." ²⁶

²⁶ D. P. Ghai, "Income policy in Kenya: Need Criteria and Machinery," East African Economic Review, Vol. IV, No. 1 (June, 1968) p. 22.

TABLE 10

TOTAL AFRICAN EMPLOYMENT IN MISCELLANEOUS MANUFACTURING
INDUSTRY

Year	Employment	Product of Manufacturing Industry Current Prices £'000
1959	17,240	4,564
1960	16,955	4,810
1961	17,896	4,969
1962	17,092	4,927
1963	17,177	5,450
1964	16,485	6,198
1965	18,612	8,549
1966	20,865	9,887
1967	23,134	10,183
1968	24,991	11,021

Source: Uganda Statistical Abstracts

Under the above East African conditions it is imperative to concentrate the major proportion of government investment in the agricultural sector, which is labour intensive. Agriculture also provides flexible production function, i.e. it permits variation in input combinations to suit the East African circumstances. Such a flexible production function permits more efficient utilization of the scarce factor capital through the use of low capital - intensive technique of production.

Industrialization has at times been advocated by some economists because of its contribution to the creation of an entrepreneurial class and the expansion of

new skills and technical innovations. This contention has however been questioned by I. Livingstone.²⁷ He claims that industrial development does not increase employment rapidly because of its capital-intensive nature. Moreover he contends that such development takes place in an enclave with limited links with the rest of the economy and therefore its effectiveness in propagating change is limited. On the otherhand, he maintains that through the introduction and expansion of cash crops we will increase commercial mindedness on a wider scale which will create indigenous entrepreneurs.

The infant industry argument combined with the learning function argument have been presented both by economists and businessmen to justify investment and protection for the import substitution sector. If these arguments are valid, protection of this sector in the short run can be justified. However experience in many countries including more developed countries like Canada has shown that such protection may be needed indefinitely. The reduction in costs, as a result of the learning function though important may still not be enough to make the sector competitive because of the small size of plant being used.

SUMMARY

This chapter has evaluated investment decision in the two strategies of

²⁷ I. Livingstone, "Agriculture versus Industry in Economic Development," Journal of Modern African Studies, Vol. VI, No. 3 (1968), p. 329-341.

economic development that are open to Uganda. Both the investment decision model and the other criteria have favored concentration of investment in the agricultural export sector. However this does not mean that the author suggests total ban on investment in the import substitution sector. Those projects in the import substitution sector which have a higher saving - capital ratio than that of agricultural export development and which fulfill some of the other criteria, should be encouraged.

CHAPTER VII

FUTURE PROSPECTS OF AGRICULTURAL EXPORTS FOR UGANDA

The recommendations for investment priorities in the last Chapter were based on an implicit assumption about the existence of a reasonably good demand for agricultural exports in the future. This chapter will therefore examine the future demand for coffee, cotton, and tea and then will look at the prospects of minor agricultural crops for Uganda.

Coffee

Coffee has in recent years become the major export crop of Uganda, surpassing cotton. In 1953 coffee output was 36,000 tons. However since then the amount of coffee produced has increased considerably. By 1965, Uganda became the fifth largest producer of coffee in the world, exceeded only by Brazil, Colombia, Ivory Coast and Angola. The Second Five Year Development Plan estimated that output in 1971 would be 240,000 tons.¹ However in 1968/69 season output has even surpassed this target because of exceptionally favourable weather conditions. Table 1 shows the total quantity of coffee production for the crop years 1961/62

¹ P.J. Gormely, "The Economic Development of Uganda with Special Reference to the 1966 - 1971 Plan," (Ph.D. dissertation, Dept. of Economics, Duke University), p. 200 (Microfilm).

to 1968/69 with an estimate for 1969/70.

TABLE 1
COFFEE PRODUCTION

Year	Coffee (thousand metric tons)
1961/62	119
1962/63	158
1963/64	172
1964/65	152
1965/66	154
1966/67	166
1967/68	133
1968/69	247
1969/70 (estimate)	170

Note: The crop year runs from October 1st to September 30.

Source: Uganda, Ministry of Planning and Economic Development,
Statistical Division, Background to the Budget, 1970 - 71,
(June, 1970), p. 11.

Similar expansion of coffee by other countries has led to an excess supply problem. Therefore in 1962 an International Coffee Agreement was set up to control the quantity of exports so that the general level of coffee prices do not decline below the general level of prices in 1962. By May, 1967 the Agreement included 38 export countries, accounting for 99.1 per cent of world exports of coffee in the base year 1961 and 23 importing countries, accounting for 96 per

cent of total imports.²

Under the above agreement each producer country is allocated a basic quota which is later raised or reduced depending upon the outlook of coffee prices. The producer country has the right to dispose the remaining balance of her production on the non quota market (i.e. sell it to countries who are not members of the Agreement). In the period 1961/62 - 1963/64 Uganda as a result of the Agreement, had to sell 9 - 14% of her total production to the non-quota market.³ In 1968/69 sales to the non-quota market were a record of 38,036 metric tons. This figure was further increased to 51,931 metric tons in 1969/70 crop season. This is despite the raising of Uganda's quota in 1969/70 season from 121,487 metric tons to 130,113 tons.⁴

The world coffee consumption during the decade ended 1961-63 have been rising at 3.9 per cent per annum. Between 1961-63 and 1975 the FAO projects that demand for coffee would grow at a rate of 2.3 to 2.6 per cent a year. On the otherhand, plans by some countries, especially Brazil, to diversify, would reduce the world growth rate of production to 1.7 per cent a year from an average of 5.8 per cent in the previous decade.⁵ Since Uganda's production rate is growing

² FAO, Agricultural Commodities - Projections for 1975 and 1985 (CCP 67/3 (Rev.), 1967, p. 220.

³ Gormerly, loc. cit.

⁴ Uganda, Ministry of Planning and Economic Development, Statistical Division, Background to the Budget 1970 - 71, (June, 1970), p. 11.

⁵ FAO, loc. cit., p. 23.

faster than the world consumption rate, the country may have to either curtail the rapid growth rate or be willing, if necessary, to sell substantial amounts to the non-quota market at lower prices.

The coffee outlook may therefore seem bleak for Uganda. However this is not necessarily so. In 1968/69 season the country had almost double the production of 1967/68 and yet it managed to sell considerable amounts of this production. This shows that Uganda has reasonably good leeway.

The quota restriction of the Coffee Agreement specifies a quantity limitation rather than a value limitation. This loop-hole can be used for the benefit of Uganda. At present most of Uganda's coffee is of the robusta variety which fetches a substantial lower price than the arabica variety. Therefore by encouraging arabica production, Uganda can expand her revenue from coffee exports.⁶ The country can also increase her export proceeds by concentrating on quality and thereby getting a quality premium. The Marketing Boards should also investigate the feasibility of disposing any surplus coffee to the communist countries through barter agreements.

Although the coffee outlook may not be very bleak in the short run, Uganda should still try to diversify into other commodities. This is necessary in order to reduce the present heavy reliance on coffee. The low income elasticity of demand for the commodity also does not make it an attractive proposition for the future.⁷

⁶ The Second Five Year Development Plan 1966/71 calls for a doubling of arabica output over the period from 10,000 tons to 20,000 tons. This will be done through improvement of yields by injecting new inputs in the form of chemicals to control disease, pests and fungi. If this can be achieved, Uganda can sell the Arabica output in the quota market and dispose a corresponding amount of robusta on the non-quota market.

⁷ The FAO publication states that the income elasticity of demand for coffee is 0.1 for United States and 0.3 - 0.5 for the Common Market countries.

Cotton

According to Balassa, cotton imports into the developed countries other than North America would amount to 2.5 - 2.6 million tons in 1970 and 2.6 - 2.7 million tons in 1975. This projection is based on a growth rate of 1 per cent per annum.⁸ The FAO predicts a growth rate of 0.8 - 1.5 per cent for developed countries and 2.2 - 4.5 per cent for the developing countries.⁹ The rapid growth in the developing countries is mainly due to population growth and increase in income.

The above prediction of about 1.5 per cent per annum should not discourage Uganda from expanding her cotton output at a faster rate. This is because Uganda supplies only 1/2 per cent of total world demand. Since she is such a minor producer of total world output, she faces a very elastic demand curve. The country will be able to dispose all her output.

Table 2 shows the total quantity of cotton production for the crop year 1962/63 to 1968/69 with an estimate for 1969/70.

TABLE 2

Year	Number of Bales in Thousand
1962/63	358
1963/64	379

⁸ Bela Balassa, Trade Prospects for Developing Countries (Homewood: Richard D. Irvin, Inc., 1964), p. 256.

⁹ FAO, loc. cit., p. 26.

Table 2 (Continued)

Year	Number of Bales in Thousand
1964/65	438
1965/66	445
1966/67	427
1967/68	345
1968/69	423
1969/70 (estimate)	469

Source: Ugands, loc. cit., p. 11

The Second Development Plan had set a target of 575,000 bales by the 1970/71 season. It appears that the plan target would not be achieved. Therefore there is a need to raise production through further investment.

Tea

The third major agricultural export crop of Uganda is tea. In 1968 Uganda exported £3.7 million worth of tea. This is a small proportion of total world output. The Second Five Year Development Plan calls for the expansion of tea output from 23 million pounds in 1964 to 42 million in 1971.¹⁰ The estimated production for 1970 is 45 million pounds, slightly beyond the planned target.

World demand for tea is projected by FAO to rise at the rate of 2.2 to 2.7

¹⁰ Kyesimira, loc. cit., p. 65.

per cent a year up to 1975. For developed countries the increase is projected at 1.3 to 1.5 per cent whereas for developing countries the increase is projected at 3.3 to 3.9 per cent a year. On the otherhand world production is projected to increase at 3.2 per cent per annum.¹¹ Since production is expected to expand faster than consumption, an attempt was made by the Asian Tea producing countries to conclude an International Tea Agreement in 1967. However the attempt was blocked by the three East African countries. These countries felt that even if the tea prices went down slightly, the crop would still be profitable to produce in East Africa. Therefore they did not want any agreement which would curtail their tea expansion programs.

The sharp decline in prices in 1968 and 1969 however led to a change of heart. An interim agreement was therefore reached in July 1969, among the tea exporters to withhold 90 million pounds of black tea from the world market. Under this agreement, Uganda was given a quota of 54.1 million pounds for 1970. It is however expected that this quota will not be fully utilized because of lower than expected production.¹²

Meat and Dairy Products

Uganda should try to diversify into commodities for which the outlook

¹¹ FAO, loc. cit., p. 24

¹² Uganda, loc. cit., p. 13.

of the future is brighter than her present export commodities. One such group of commodities is dairy products. An FAO study came to the following conclusion regarding their prospects:

"During the decade ahead, demand for milk and milk products, according to the projections, will increase faster than production in the world as a whole and especially in developing countries." ¹³

A similar conclusion was reached for meat products:

"In the developed importing countries the demand for beef, veal, mutton and lamb was expected to grow much faster than domestic supplies. The projected export availabilities in the developed exporting countries would fall short of the requirements of the importers in this group alone." ¹⁴

The future prospects for milk and meat products are very bright because of the high income elasticity of demand for these products both in the developed and in the developing countries. Moreover these products have a high price elasticity of demand and therefore their prices, would be subject to a lesser degree of fluctuations.

The Uganda government is therefore trying to foster the development of livestock and dairy industry. One of the methods used to achieve this is to upgrade the local cattle stock through the import of highgrade cattle. In 1969 two loan agreements were therefore made with Canada and Netherlands for the import of a total of 1,300 Freisian cattle into Uganda. The government has also established several

¹³ FAO, "Agricultural Commodity Projections for 1975 and 1985," Monthly Bulletin of Agricultural Economics and Statistics, Vol. 17, No. 6 (June, 1968), p. 13.

¹⁴ FAO, "First Ad Hoc Consultation on Meat and Poultry," Monthly Bulletin of Agricultural Economics and Statistics, Vol. 18, No. 10 (October, 1969), p. 12.

programs for tsetse control, tick control, and vaccination program against rinderpest.¹⁵ It is expected that these measures would make Uganda self-sufficient in these products and within a few years provide substantial amount for export.

Other Agricultural Products

F.I. Nixon¹⁶, in a report submitted to the Uganda export Promotion Council, gave a list of agricultural and horticultural exports which had a promising future. His list mentions maize-starch, beans, peas, cut flowers, fresh vegetables, castor seeds, ground nuts, cashew nuts, palm oils and kernels, soya beans, papain, vegetable oils, sorghum, pineapples, cocoa and unmanufactured tobacco. He said that there was market for these products in industrialized countries but the export development was hindered by some constraints. Giving the example of fresh vegetables he said that European vegetable importers were interested in Uganda produce and air space was available to transport it to Europe. However Uganda production was not sufficient to meet these export demands. This was because there was no incentives for farmers to produce sufficient quantities. There was lack of relevant market information and the country did not have a proper buying and marketing organization. All this was due to shortage of finance and skilled personnel.

¹⁵ Uganda, loc. cit., p. 15.

¹⁶ F.I. Nixon, "Some Reflection on Export Promotion in Uganda," EDRP Paper No. 160, Makerere Institute of Social Research, p. 3.

Nixson in his recommendations advocates the establishment of an organizational structure which would link production promotion and export efforts.¹⁷

Rukandema¹⁸, in a paper presented to the Rural Development Seminar advocates the establishment of a Uganda market research organization which would be responsible for collecting and transmitting world market information to the farmers in an effort to avoid misallocation of resources and optimize the export earnings.

The studies of Nixson and Rukandema show that there is a future also for other agricultural exports commodities provided that the country is prepared to establish the necessary institutions to promote and co-ordinate production and export promotion. This would require considerable investment in establishing institutional structure, importing foreign personnel, and training local manpower to take over these functions. The country will also have to be flexible and thereby ready to shift production from less profitable lines to more profitable lines as the world market conditions alter.

SUMMARY

This study has investigated the future prospects for agricultural exports. It

¹⁷ Ibid., p. 8.

¹⁸ Rukandema, "Foreign Demand and Supply Analysis and Planning for the Agricultural Export Sector," RDR Paper No. 83, Makerere Institute of Social Research, p. 12.

appears that the prospects are reasonably good for Uganda. The country should however try to reduce her heavy reliance on coffee and cotton. This is necessary in order to diversify risk and to take advantage of more profitable opportunities in other commodities.

CHAPTER VIII

SUMMARY AND CONCLUSION

The main conclusion of this study is that agricultural export development is still the best strategy for bringing about rapid economic development in Uganda.

This conclusion is basically the result of evaluating four key issues:

- 1) Has Uganda benefited from agricultural export development?
- 2) Are the arguments presented by various economists against relying on agricultural commodities valid for Uganda?
- 3) Is agricultural export development a superior strategy than import substitution industries as far as Uganda is concerned?
- 4) What is the future scope of Uganda's agricultural export commodities?

From the analysis in Chapter III it can be seen that Uganda has benefited considerably from specializing in agricultural exports. These exports have provided the major source of cash income for the Uganda farmers. The government has gained considerable amount of revenue through export taxes. Agricultural exports have also provided substantial amounts of funds for capital investment in Uganda.

The arguments presented against relying on agricultural commodities were found to be of limited applicability in Uganda. Although Uganda has suffered in the past from agricultural export instability, their effects on the domestic economy could be reduced in the future with the recent establishment of the Bank of Uganda. The government through better use of the marketing boards can also help to stabilize the

income of Uganda farmers and thereby reduce its multiplier effect on the economy.

The terms of trade argument was found to be valid for Uganda. However the author feels that a deterioration of the terms of trade at the rate of about 1 per cent per annum is not a significant reason to stop further investment in the agricultural export sector. This is because the opportunity cost of investment elsewhere is not that high.

The two main strategies of economic development that are open to Uganda were evaluated in Chapter VI. The main criteria used for this evaluation was the use of saving-capital ratio. This criteria was chosen because the author feels that savings, and through it investment, is one of the key variables in economic development. The results of the calculations made to estimate the saving-capital ratios showed that agricultural export development had a much higher saving - capital ratio. Even if we discount the value of this figure by about 10 or 20 per cent to compensate for any error made because of the somewhat crude technique used, the ratio would be significantly above that of the import substitution strategy. Therefore the author feels that agricultural export strategy is a better strategy than import substitution industries. This same conclusion was arrived at when some other criteria were used as evaluating standards.

Chapter VII discusses the future scope of agricultural exports of Uganda. The author feels that the outlook is bright if the country is willing to make the necessary investment in establishing institutions to encourage production and marketing of these crops. Uganda, being a small producer in relation to world demand, has

plenty of leeway.

The author in this study has advocated agricultural export development strategy for raising the standard of living of the people in Uganda. This position does, in no way imply that there should be no investment in other sectors. All investment projects, no matter in what sector, have to go through a feasibility study. The conclusion regarding the superiority of agricultural export development only means that most investment projects would fall in this sector if the criteria laid down in this study are followed.

The advocacy of agricultural export development is valid as long as the parameters used in the investment decision model remain constant. Changes in these parameters in future will affect any consequent decision regarding the choice of an optimum strategy for development. Therefore the results of this study should only be used to make short run decisions on allocation of resources for development.

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